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ARCHAEOLOGY IN ALBERTA 1984

David Burley

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David Burley

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A REVIEW OF ARCHAEOLOGY IN ALBERTA IN 1984

By
Paul Donahue
Archaeological Survey of Alberta

The main intent behind the Archaeological Survey of Alberta's publication of these annual reports is to make available, in a useful and consistent format, up to date information on all permitted projects that have occurred during the year under review. This is done so that individuals are made aware that complete reports on these investigations are available at the Archaeological Survey of Alberta; to provide readers with brief reports on research projects of interest, significant new finds, and methodological advances; and to provide a status report on events that have transpired at the Archaeological Survey of Alberta during the review year.

In 1984, 105 archaeological permits were issued, and five were later cancelled (Table 1). The final figure of 100 excavation permits is less than half of the number that were completed in 1981, the peak year of archaeological activity in Alberta. Permitted projects closely approximate the level of activity which occurred in 1977 when 109 permits were issued. Eleven percent (11%) of the 100 permits issued in 1984 were not directed at proposed development related activities. Of the 90 development related projects, 58 (64%) involved private sector developments and 32 (36%) were necessitated by government construction. Linear developments accounted for 34 permits (38%), area developments for 50 permits (56%) and subdivisions for 6 permits (7%). Compared to last year, the percentages of linear developments and subdivisions decreased by 28% and permits for area development projects increased by 46%.

These statistics reflect a number of things. In terms of subdivisions, for example, development is down overall from a high of 53 subdivision related permits issued in 1981, accounting for 25% of all permits issued. It also reflects the fact that very few of the 2300 subdivision applications which were received by the Archaeological Survey of Alberta in 1984 were determined to have the potential of seriously impacting historical resources. This, in large measure, is tied into the overall decrease in size of new subdivisions, and the fact that many subdivisions previously cleared of historical resources concerns have not yet been developed. These statistics also reflect the fact that the Archaeological Survey of Alberta continues to undergo constant evaluation of its systems, policies and procedures in order to ensure that efforts are directed at those projects most potentially productive in terms of historical resources conservation and knowledge return.

In this respect, and as part of the mandate of the Archaeological Survey of Alberta, staff continue to undertake research projects in order to enhance resource management capabilities and to increase the general level of knowledge regarding Alberta's past. Of the 12 non-development related research permits issued, seven were issued to staff members and five to others. Of these five, four were contracted for by the Archaeological Survey of Alberta. Most of the research projects were related to interpretive developments, although some were undertaken for non-development oriented purposes, i.e., resource management and research investigations.

The overall ratio of development oriented projects to research projects in 1984 was 7:1. In 1975, the peak year for research oriented projects, the development to research ratio was 1:1 (26 research permits out of a total of 56 permits), whereas the peak year for development oriented projects was 1981, at which time the ratio was 18:1. The actual number of research permits per year has averaged 15 since 1981. In short, the level of research effort has been fairly constant since 1981, whereas development related permits peaked in that year and then tapered off drastically.

The permits issued in 1984 resulted in the recording of 697 sites, bringing the provincial inventory to 15,200 sites. The 100 permitted projects were scattered across the province, with 23 in the Eastern Slopes, 38 in the Plains, 29 in the Parklands and 20 in the Boreal Forest. Additionally, Parks Canada, Western Region, conducted fieldwork in Banff, Jasper, Waterton and Elk Island National Parks.

Much of what was accomplished in Alberta in 1984 has been reported by Bruce Ball (1984). To briefly reiterate his report, investigations were undertaken in the Crowsnest Pass by Margaret Kennedy (Lifeways) who directed mitigative excavations at the Livingstone Quarry and Green Creek sites, and by Brian Ronaghan (Archaeological Survey of Alberta) who conducted excavations at six stratified sites. Cultural material was recovered from below Mazama ash lenses in three of the sites excavated by Ronaghan. Further north, Daryl Fedje (Parks Canada) continued mitigative work at sites scheduled to be impacted by highway construction near Banff. Included in this programme was the very significant 11,000 year old Vermilion Lakes site. Rod Pickard (Parks Canada), excavated at two prehistoric and two historic sites near Jasper.

In the foothills to the east of Crowsnest Pass, Jack Brink (Archaeological Survey of Alberta) continued mitigative and research investigations at Head-Smashed-In Buffalo Jump. Emphasis was placed on exploring aspects of the site area that are still poorly known (e.g., drive line studies, petroglyphs, a vision quest and camp/processing area). Research and analysis are directed toward developing and testing hypotheses on prehistoric utilization of bison and current arguments regarding nutrition and seasonality. Head-Smashed-In, a U.N.E.S.C.O. World Heritage Site, is scheduled to be interpreted to the public by 1987, with the opening of an interpretive centre. In concert with these investigations is a study by Bob Vance, Paleoenvironmentalist with the Archaeological Survey of Alberta, on drought climates of southern Alberta. Data recovered from various sediment sections will provide the basis for interpreting the frequency and severity of droughts in the area.

Turning to the Plains portion of southern Alberta, Bea Loveseth and Jim Calder (Lifeways), as part of their Badger Reservoir mitigative studies, are attempting to predict the occurrence of activity areas within tipi ring features using analyses of phosphate levels. John Brumley and Michael Quigg (Ethos) are completing an inventory and analysis of medicine wheels on the Plains under contract to the Archaeological Survey of Alberta. This study focused on the typological variation and spatial distribution of these rock feature sites. In the Crawling Valley, east of Calgary, Colin Poole, Rebecca Balcom and Bruce Wright (ARESCO) undertook a major investigation of tipi ring sites as part of a mitigation project. This study is focused on examining current hypotheses concerning structural aspects of tipi rings. A large sample of ceramics was reported by Rod Heitzmann (Fedirchuk McCullough) from a site on the Little Bow River near Carmangay. This mitigative excavation was later expanded by Ray LeBlanc and Rod Vickers (Archaeological Survey of Alberta). Gerald Conaty, under contract to the Archaeological Survey of Canada and the Archaeological Survey of Alberta, was charged with providing an inventory of heritage resources on Blood Reserve 148, within the area between the confluences of the Belly and the Oldman rivers and the St. Mary's and Oldman rivers. An oral history sub-project figured heavily in the study.

Further north, in the Parkland area, Bruce Ball (Archaeological Survey of Alberta) conducted a test excavation of the Chabot site on Buck Lake, southwest of Edmonton. The site evidenced affinities with known Early Middle Prehistoric and Late Prehistoric complexes. Ball also recorded two large bison jumps, one in the Big Bend area of the Red Deer River east of Red Deer, the other on Berry Creek east of Hanna. Both sites are relatively large and appear undisturbed. The former is quite unique in that the height of the actual jump face is over 50 m. James Helmer, University of Calgary, directed field school investigations at the Strathcona Archaeological Centre site for the third consecutive year under a five year contract with the Archaeological Survey of Alberta. The Strathcona site is a Middle and Late Prehistoric site in Edmonton which is operated as a public interpretation programme, research project and archaeological field school during the summer months.

In northwestern Alberta, field investigations undertaken by John Pollock (Settlement Surveys) as part of a mitigative study recorded a major historic and Late Prehistoric settlement site in the Iosegun Lake region.

A number of historic archaeological projects were undertaken throughout Alberta in 1984. Ed McCullough (Fedirchuk McCullough) under contract to the Archaeological Survey of Alberta, was responsible for seeking out and assessing Greenwich House and Red Deer House, two nineteenth century fur trade sites in the Lac La Biche area, and for evaluating the remains of the Lac La Biche Hudson's Bay Post for designation purposes. Rebecca Balcom (ARESCO) was contracted by the Archaeological Survey of Alberta to investigate a Ukrainian burdei, or pithouse dwelling, in order to recover information that would aid in the reconstruction of a burdei at the Ukrainian Cultural Heritage Village, a major Alberta Culture interpretive development. Heinz Pyszczyk

(Archaeological Survey of Alberta) was responsible for overseeing this contract as part of his larger duties directed at archaeological investigations and planning team responsibilities for the Ukrainian Cultural Heritage Village. Pyszczyk spent most of the field season investigating a number of Ukrainian homesteads in Alberta. His research provided building construction data for the Village in addition to obtaining artifact and faunal data to be used in examining questions of ethnicity and the acculturation processes of ethnic groups. Pyszczyk devoted a smaller portion of the field season to investigations in northwestern Alberta where he conducted test excavations at the 1877-1918 Hudson's Bay Company Fort Dunvegan. His main objectives were to assess the archaeological integrity of the site, and to acquire an artifact and faunal assemblage spanning this period of the northern Alberta fur trade.

Michael Forsman (Archaeological Survey of Alberta) investigated three sites: the Victoria Methodist Mission site northeast of Edmonton on the North Saskatchewan River, the original townsite of Fort Macleod in southwestern Alberta, and the Boundary Creek Northwest Mounted Police Post in southwestern Alberta. Work at the mission site will aid in the interpretive programme at this site which is open to the public. Investigations at Fort Macleod and Boundary Creek Post were directed at assessing the condition of extant remains for conservation and designation purposes. Margaret Kennedy and B. O. K. Reeves (Lifeways) completed an inventory and assessment of whiskey posts in Alberta under contract to the Historic Sites Service branch of Alberta Culture.

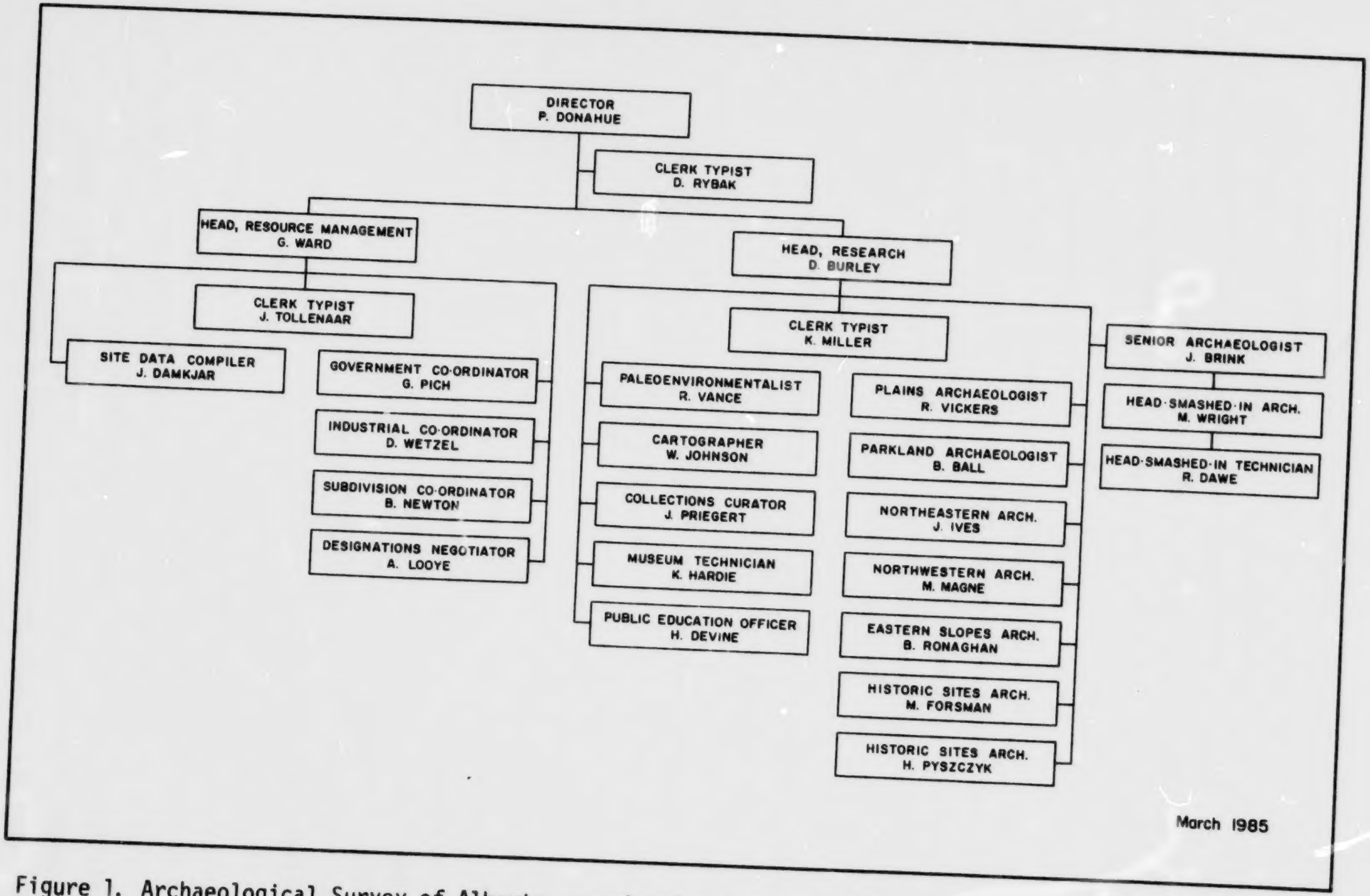
A number of other in-house research projects continued but did not involve fieldwork in 1984. Ray LeBlanc, who has recently taken a position at the Archaeological Survey of Canada, has completed and submitted for publication, a technological study on a microblade assemblage from the Bezya site located in northeastern Alberta. The blade technology at this 4000 year old site appears most similar to that found in sites in the southern Yukon, interior Alaska and the Fisherman Lake region of the Northwest Territories. (Martin Magne has recently been hired as the new Northwestern archaeologist.) John Ives (Archaeological Survey of Alberta) and Mark Fenton (Alberta Research Council) continued their work on cultural and natural distributions of Beaver River Sandstone in the Athabasca River Valley and Birch

Mountains. David Burley has been directing a tipi ring study with the express intent of evaluating the data base and the techniques used to assess such sites in order that improved research and resource management practices may be proposed.

As to the products derived from archaeological investigations around the province, there were 113 permit reports accessioned into the Archaeological Survey of Alberta library. These represent a major data source to archaeologists and, consequently, all permit reports are now on microfiche, and copies are located at the Department of Archaeology, University of Calgary. Nine of the permit reports were by staff archaeologists who also produced six published papers, five conference papers and gave eleven public presentations. In addition, Archaeological Survey of Alberta staff team taught a class on Alberta Archaeology at the University of Alberta. Staff have also been working on thematic volumes, three of which are focused on the Plains, Parklands and Eastern Slopes and one of which focuses on historical archaeology. The Plains volume, which is a collection of papers presented at the 1984 Canadian Archaeological Association meetings, is to be published concurrently with this volume. A major synthesis on Plains prehistory has been completed by Rod Vickers and will be published shortly.

Publications, conference papers and public talks all form part of the broader Archaeological Survey of Alberta mandate to educate the public about the past. In order to more successfully accomplish this task, the Archaeological Survey of Alberta recently created a Public Education Officer position (Figure 1). The incumbent, Heather Devine, is now responsible for creating an awareness of Alberta's prehistoric past and the need for heritage preservation by developing both public education and school-based programmes. One major initiative that will be undertaken is the development of a grade school programme in archaeology and prehistory with emphasis on Alberta. The ultimate objective here is to provide additional curricular materials designed to increase Albertans' understanding and appreciation of the rich multicultural heritage that has shaped our society.

In order to further professional awareness within the province, the Archaeological Survey of Alberta has worked with the Universities of Calgary and Alberta to bring in visiting speakers. To this end, Dr.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March 1985

Figure 1. Archaeological Survey of Alberta organizational chart, 1984.

Robert L. Stephenson, Director of the Institute of Archaeology and Anthropology, University of South Carolina visited Edmonton and Calgary to discuss the roles and functions of the Institute.

Since the Archaeological Survey of Alberta was established ten years ago, it has become a major factor in determining the nature and direction of archaeological research and conservation measures undertaken in Alberta. The Archaeological Survey of Alberta has a legislated role that is manifest in all major development projects and a great many minor ones; in addition, it is responsible for accomplishing numerous research and development tasks designed to contribute to the understanding and public awareness of Alberta's past. Given the establishment of first order principles and responsibilities, ongoing internal and external changes in roles, perceptions, knowledge, etc., it was determined that it was an opportune time to review the operation of the Archaeological Survey of Alberta in order that future programme and management directions could be more clearly defined and put forward as measurable objectives.

Accordingly, the management consulting firm of Touche Ross and Partners was contracted to develop a management plan that would clarify for senior government decision makers, business and professional communities, staff and the public, the future direction of the Archaeological Survey of Alberta. The management plan was completed in March, 1984 and a number of programme priorities were identified. As well, a schedule for accomplishing them was developed. The plan was subsequently received by senior management within the Department of Culture and accepted. Discussions with major interest groups were then held in order to explain the plan in greater detail.

Since the spring of 1984, a number of programme priorities have been addressed. Among the most significant ones are the hiring of a Public Education Officer, development of a public education programme, increased liaison with major stakeholders, drafting of significance criteria for prehistoric archaeological sites, revisions of archaeological guidelines, initiation of provincial research objectives, and initiation of a records management study and implementation of a revised system. Other priorities are or have been addressed. All programme priorities identified in the management plan should, with some revisions, be completed by March, 1987.

In retrospect, 1984 has been a very busy and productive year at the Archaeological Survey of Alberta. Significant and beneficial changes are in various stages of completion. The implementation of these changes should be to the benefit of the resources, the public and the discipline.

Table 1. 1984 project permits issued by the Archaeological Survey of Alberta.

Permit	Archaeologist	Project
84-1	Mike Quigg	Dome Petroleum Ltd.; gas pipeline; Jenner
84-2	CANCELLED	
84-3	Bea Loveseth	Alberta Transportation; Borrow pit expansion/assessment of DjPm-1; Cowley
84-4	Eugene Gryba	County of Vulcan; bridge crossing of Little Bow River; Carmangay
84-5	Rod Heitzmann	Western Decalta Petroleum Ltd.; Diamond Valley gas pipelines; Turner Valley
84-6	Rod Heitzmann	TransAlta Utilities; transmission line; High River
84-7	John Pollock	Mr. S. Tkachuk; country subdivision; Lac La Biche
84-8	Shawn Haley	Alberta Transportation; gravel pit; Turner Valley
84-9	Stanley Van Dyke	Edmonton Power; Mitigation of FiPo-138, Genesee; St. Francis
84-10	Stanley Van Dyke	Fording Coal Ltd.; coal mine - Genesee Project; St. Francis
84-11	Bea Loveseth	Alberta Environment; Badger Reservoir assessment and mitigation; Vulcan
84-12	John Brumley	Eastern Irrigation District; cultivation for pasture; Brooks
84-13	Jim Wood	Wildwood Regional Recreation Board; Peers recreation area; Peers
84-14	Mike Quigg	Alberta Recreation and Parks; Picnic area/assessment of EaPg-3; Carmangay

Permit	Archaeologist	Project
84-15	John Pollock	Texaco Canada Resources Ltd.; NGL pipeline; Bonnie Glen to West Pembina
84-16	Rebecca Balcom	Gulf Canada Resources; Garrington-Caroline gas pipeline; Caroline
84-17	Rebecca Balcom	Wellore Resources; well sites; Jenner
84-18	Eugene Gryba	Alberta Recreation and Parks; Saskatoon Island Provincial Park; Grande Prairie
84-19	Rod Heitzmann	Home Oil Co. Ltd./Federated Pipelines Ltd.; Fort Saskatchewan - Namao tie-in pipeline
84-20	Brian Reeves	Hydrocon Engineering (Continental) Ltd.; fishing access/parking lot/ wharf; Tyrrell Lake
84-21	Shawn Haley	Alberta Transportation; highways construction/gravel pits; central and southern Alberta.
84-22	CANCELLED	
84-23	Sheila Minni	City of Red Deer; Waskasoo Park; Red Deer
84-24	John Pollock	Apex Gravel Ltd.; Galloway gravel pit; Edmonton
84-25	Sheila Minni	Mr. J. Ducs; Mayfair Village country residential subdivision; Grande Prairie
84-26	Mike Quigg	Alberta Transportation; SR 879/mitigation of DiOu-7 to 11; Foremost
84-27	John Pollock	W-Five Construction Ltd.; Mayfair Village mobile home subdivision; Devon
84-28	James Helmer	Alberta Culture; research at Strathcona site; Edmonton

Permit	Archaeologist	Project
84-29	John Pollock	Alberta Transportation; Highway 29 mitigation (FjPm-6)/ assessment of Shaw gravel pit; Stony Plain/Steeper
84-30	John Pollock	Mr. J. Doz; recreational subdivision; Edmonton Beach
84-31	Heinz Pyszczyk	Alberta Culture; St. Saviour's Anglican Mission (GlOp-7)/Fort Dunvegan (GlOp-8); Fairview
84-32	Brian Reeves	City of Lethbridge; Lethbridge Urban Parks; Lethbridge
84-33	Margaret Kennedy	TransAlta Utilities; Crowsnest Pass transmission line; Coleman-Blairmore-Frank
84-34	Barry Dau	Alberta Transportation; Hwy. 1 mitigation at DlOo-10,11,12,14,15, DlPb-4; Medicine Hat
84-35	Jack Brink	Alberta Culture; mitigation/ research at Head-Smashed-In Buffalo Jump (DkPj-1); Fort Macleod
84-36	Brian Ronaghan	Alberta Culture; research in Burmis-Lundbreck corridor; Crowsnest Pass
84-37	Bruce Ball	Alberta Culture; research and monitoring FfPq-3, FgPq-3, FbPi-3, Sheerness area; Buck Lake/Bittern Lake/Stettler/Hanna
84-38	Rod Heitzmann	County of Vulcan; highway development/bridge approaches; Carmangay
84-39	Bruce Wright	Loyal Order of Moose; recreational development; Medicine Hat
84-40	Jim Calder	TransAlta Utilities; transmission line; Langdon to B.C. border
84-41	John Brumley	Ocelot Petroleum Ltd.; well sites; Grassy Lake

Permit	Archaeologist	Project
84-42	Michael Forsman	Alberta Culture; research at Boundary Creek N.W.M.P. post (DgPi-14); Cardston
84-43	CANCELLED	
84-44	Bea Loveseth	Top Notch Construction; Badger Reservoir borrow sources; Bow City
84-45	Rod Heitzmann	West Coast Petroleum; Crystal Field water supply pipeline; Buck Lake
84-46	Michael Forsman	Alberta Culture; mitigation of McDougall Methodist Mission House (GaPc-7); Smoky Lake
84-47	Michael Forsman	Alberta Culture; mitigation and assessment at Fort Macleod (DkPi-17); Fort Macleod
84-48	Rod Heitzmann	West Coast Petroleum; water pump house; Buck Lake
84-49	CANCELLED	
84-50	Stanley Van Dyke	Gulf Canada Products Co.; West Fenn oil pipeline; Big Valley
84-51	John Brumley	Corrida Oils; gas wells; Town of Seven Persons
84-52	Heinz Pyszczyk	Alberta Culture; research at Yurko, Makowichuk & Rosychuk farm sites/ Myrnam Blacksmith Shop; Smoky Lake/Hairy Hill/Myrnam
84-53	Stanley Van Dyke	Syncrude Canada Ltd.; Syncrude Lease No. 22; Fort McMurray
84-54	Rod Heitzmann	Novacorp Pipeline Ltd.; Leming Lake lateral pipeline; Lac La Biche
84-55	Rebecca Balcom	Westmin Resources Ltd.; Lindbergh water pipeline; Elk Point
84-56	Eugene Gryba	Alberta Recreation and Parks/ Transportation; Zeiner, Little Fish Lake, Dinosaur Provincial Parks developments/Callaghan gravel pit; Thorsby, Drumheller, Brooks, High River

Permit	Archaeologist	Project
84-57	Brian Reeves	Royal Bank of Canada; Elbow River Country Club Clubhouse; Calgary
84-58	John Brumley	Alberta Transportation; Upgrading of Wildcat Road/ mitigation of 16 stone circle sites; Elkwater
84-59	Edward McCullough	Rozsa Petroleum Ltd.; Knappen well sites; Milk River
84-60	Jim Calder	Rainbow Pipe Line Co. Ltd.; Senex - Sawn Lake pipeline extension; north of Slave Lake
84-61	Edward McCullough	Historical Resources Foundation/ Alberta Culture; research at Lac La Biche post, Greenwich House, Red Deers Lake House I; Lac La Biche
84-62	Rebecca Balcom	Manalta Coal Ltd.; Montgomery Mine expansion; Hanna
84-63	Rebecca Balcom	Alberta Recreation and Parks/ Olympic Secretariat; Olympic ski facilities developments; Canmore/Kananaskis Valley
84-64	Jennifer Hunt	Alberta Transportation; Highway 27 upgrading; Three Hills
84-65	Gerald Conaty	Alberta Culture/Archaeological Survey of Canada/Environment Canada; research, Blood Historic Sites Development Project; Blood Reserve, near Lethbridge
84-66	Edward McCullough	Husky Oil Operations Ltd.; Wainwright - Lloydminster pipeline
84-67	Brian Reeves	Alberta Fish and Wildlife; McKinnon Flats development; Bow River, near Carseland
84-68	James Light	Altex Resources Ltd.; Maple Glen well site; Endiang
84-69	Stanley Saylor	Home Oil Co. Ltd.; Manyberries pipeline; Milk River/Manyberries

Permit	Archaeologist	Project
84-70	Gloria Fedirchuk	Alberta Transportation; gravel pit expansion/ mitigation EaPk-96,97; Stavely
84-71	Stanley Van Dyke	Shell Canada Resources Ltd.; Peace River in situ pilot project; Peace River
84-72	Rebecca Balcom	Alberta Transportation; Sundre airport/SR 527 expansion; Sundre/Stavely
84-73	Edward McCullough	Western Oilfield Environmental Services Ltd.; North Plain Lake pipeline; Two Hills
84-74	Jennifer Hunt	Gemini Engineering; Rumsey pipeline; Trochu
84-75	Eugene Gryba	Clayton Surveys Ltd.; subdivision; Cochrane
84-76	Jim Calder	Suncor Inc. Exploration Resources Group; well site; Drumheller
84-77	John Pollock	Dome Petroleum Ltd.; heavy oil recovery plant; Elk Point
84-78	Rebecca Balcom	Gulf Canada Resources Inc.; Lonepine Creek pipeline; Carstairs - Crossfield
84-79	Stanley Van Dyke	Burnco Rock Products Ltd.; gravel pit/mitigation of EgPn-208; Calgary
84-80	John Brumley	Kandex Resources and Development Inc; well site; Milk River
84-81	Bea Loveseth	Peace Pipe Line Ltd.; Valhalla - Spirit River pipeline extension; Grande Prairie
84-82	Bea Loveseth	Alberta Transportation; SR940 upgrading; Sundre
84-83	John Pollock	Texaco Canada Resources Ltd.; Frog Lake Exploration program - well sites and access road; Frog Lake

Permit	Archaeologist	Project
84-84	Stanley Saylor	Home Oil Co. Ltd.; Manyberries pipeline/mitigation of DgPa-3,4, DiOw-6; Milk River/Foremost
84-85	Gloria Fedirchuk	Esso Resources Canada Ltd./ TransAlta Utilities Corporation; Judy Creek North thermal coal project; Swan Hills
84-86	Gloria Fedirchuk	Amoco Canada Petroleum Ltd.; Elk Point thermal project; Elk Point
84-87	Bea Loveseth	Alberta Transportation; Cowley gravel pit/ mitigation of DjPm-1; Cowley
84-88	Margaret Kennedy	United Church Historic Sites Committee; research at McDougall Mission site; Cochrane
84-89	Peter Bobrowsky	Alberta Transportation; Elk River Road/Smoky River Road; Lodgepole/Grande Cache
84-90	Stanley Van Dyke	Coseka Resources; Liege Prospect gas pipeline; Fort McMurray
84-91	John Pollock	Cross Country Realty; Dunes country subdivision; Grande Prairie
84-92	Shawn Haley	Alberta Housing Corporation; North-East Benchlands subdivision; Canmore
84-93	Gloria Fedirchuk	Esso Resources Canada Ltd.; Cold Lake commercial area; Grand Centre
84-94	Heinz Pyszczyk	Alberta Culture: assessment of Hunt House; Calgary
84-95	James Light	Norcen Energy Resources; Majorville well site access road; Milo
84-96	Rebecca Balcom	Alberta Culture; research at Ukrainian "burdei" (FkOv-4); Two Hills

Permit	Archaeologist	Project
84-97	John Pollock	Alberta Power Ltd.; H.R. Milner - Simonette transmission line; Grande Cache
84-98	Bea Loveseth	Suncore Inc. Resources Group; well sites; Drumheller
84-99	Rebecca Balcom	Canadian Superior Oil Ltd.; Taber pipeline and well site; Taber
84-100	Bea Loveseth	Gulf Canada Resources Inc.; Dome Lease well site; Innisfail
84-101	Stanley Saylor	PanCanadian Petroleum Ltd.; well site/access road; Carmangay
84-102	CANCELLED	
84-103	Bea Loveseth	Suncor Inc. Resources Group; Manyberries well site; Manyberries
84-104	Stanley Saylor	Bow River Pipe Lines Ltd.; Chin Coulee pipeline extension; Foremost
84-105	John Brumley	Petro-Canada; well site/access road; Manyberries

ALBERTA HOMESTEAD ARCHAEOLOGY: SOME THOUGHTS ABOUT PRESENT RESEARCH AND FUTURE NEEDS

By
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INTRODUCTION

During the 1983 and 1984 field seasons, archaeological investigations were conducted at a number of Ukrainian sites in central Alberta for the Ukrainian Cultural Heritage Village Project (U.C.H.V. Project). The U.C.H.V. is composed of numerous Alberta Ukrainian historic buildings moved from their original locations and combined at the village site, in their respective rural contexts. The main purpose of this paper is to briefly describe the preliminary research results obtained from those investigations and to provide some potential directions for future archaeological research at early farm sites. The 1984 results will be used to illustrate methods useful for examining various research problems that can be investigated with data gathered from such Ukrainian homestead sites in particular, and other homestead sites in general. And finally, the paper will examine the kinds of methodological questions and data collection problems which must be overcome in order to use the archaeological assemblages from such sites to address relevant research problems. The ultimate aim, therefore, is to begin to propose some general guidelines that can be followed by archaeologists for future research and development of these and other rural sites in Alberta.

There are a number of reasons why description and discussion of research conducted at Alberta farmstead sites is necessary now. By far the most important reason is to clearly justify why these historic resources deserve protection and why they are important for research purposes. This implies that we must begin to demonstrate the general relevancy of research questions that can be asked about this data base before such protective action can be taken. This paper cannot address all the possible research questions, but a few general problems that are relevant to investigations of past rural life in Alberta, and that are compatible with the available archaeological data base, can be examined.

The identification of relevant research directions is a very important aspect of archaeological research. However, it is also equally important and of more immediate concern to examine which data recovery methods are most suitable for homestead sites in order to eventually examine the research questions. Since we presently know little about the archaeological characteristics of this data base, it is difficult to determine now what the most suitable recovery methods might be. Although research at Ukrainian homestead sites is only in the preliminary stages, it is at a sufficient level to begin to describe some of those characteristics and to propose what data recovery methods might be most appropriate. Such information should be of value to other researchers interested in historic homestead archaeology.

The results of these investigations can also be applied to research, planning and development of other rural sites in Alberta. Some of the research problems presented here, and certainly the results of the methodological and data collection considerations, should have some applicability to a host of other ethnic farm sites located throughout Alberta. While the purpose of this paper is not to define a rigid standard for the future examination of all rural sites, it does begin to provide a basic format which can be modified when more farmsteads have been examined.

Finally, the results obtained from this examination of Ukrainian homestead sites also have broader implications, particularly for the very aggravating and controversial problem of deciding the type of archaeological data to be collected when no well defined research questions have been proposed. For the most part, this issue can never be completely resolved because it is impossible to know what future research paradigms may evolve in archaeology. However, the preliminary results of Ukrainian homestead research will be used to address this issue in hopes of providing some direction for future data acquisition at rural archaeological sites. The point here is that it is more important that the collection of archaeological data be designed so that it can be effectively used for certain fundamental types of measurements; it is these measurements that are ultimately necessary to test any potential research questions.

ORGANIZATION

I would like to briefly comment on the way this paper has been organized and what it tries to demonstrate. After the next section (Study Background) the paper is divided into three major parts: 1) some general research problems dealing with ethnic groups; 2) methodological problems, or ways of operationalizing and measuring questions about ethnicity; and, 3) archaeological data collection. Although most people would readily agree that these three parts are related, it is not always clear how they are related and why archaeological data collection is such an important segment of research. In fact, I would argue that the archaeological data collection should be the single, most important consideration for any archaeologist who deals with these sites in the province, regardless of what research questions are asked of the data base. Thus, in the last section of the paper dealing with archaeological data collection, I will try to demonstrate that, in order for the data to be properly collected, it is presently more important to determine the nature of this archaeological data base. I will try to show that all of the fundamental archaeological measurements that are used to address any research questions are invariably affected greatly at this initial stage of research.

STUDY BACKGROUND

HISTORICAL CONTEXT

Although the Homestead Act was passed in 1872, allowing settlers greater access to lands in western Canada, the mass migration of people into east-central Alberta did not take place until the 1890s, with the improvement of transportation in the west. The migration of people into this region of Alberta consisted primarily of settlers from eastern Europe (Moravians, Germans, Galicians, Bukovinians and Ruthenians).

The majority of these people came from rural eastern European peasant economies, possessing their own cultural values and lifestyles.

The region east of Edmonton contains some of the oldest Ukrainian settlements in Alberta and before 1915, was settled primarily by Bukovinians and Galicians (Figure 2). To a large degree, these new settlers continued to practice the traditional farming economies to which they were accustomed. Because of their relatively close proximity to one another, they set up close social ties which later developed and extended into rural towns after World War I. Such ties led to a maintenance of distinct traditional language, lifestyle, and religious beliefs, which lasted well into the 1930s and, in some respects, at least parts of these traditions are still present today. The study of this group of immigrants in central Alberta is important to understand the history and settlement of western Canada, and is ideal for examining aspects of ethnicity and culture change of immigrant groups.

ARCHAEOLOGICAL INVESTIGATIONS

The Ukrainian Cultural Heritage Village Project was initiated by a group of interested Ukrainian citizens in order to promote and display Ukrainian culture and lifeways in Alberta. In 1981, the project was taken over by Historic Sites Service, Alberta Culture, who provided additional financial and technical support and expanded the program considerably. Many historic Ukrainian buildings were moved from their original locations in old farmsteads or small towns in east-central Alberta to the Village where they are being restored and placed in their proper historic setting. The Village, therefore, serves as a focal point where Canadians can learn about Ukrainian culture. It is designed to portray Ukrainian rural and small town life in Alberta from the late 1800s and continuing into the 1940s and 1950s.

Archaeological investigations for the Ukrainian Village Project were begun in 1983 by the Archaeological Survey of Alberta. The major goals of this program were to provide detailed architectural and landscape information for various types of Ukrainian buildings, farm layout (e.g., building locations, fence lines, gardens, etc.), and to contribute a better knowledge of Ukrainian material culture used throughout the early

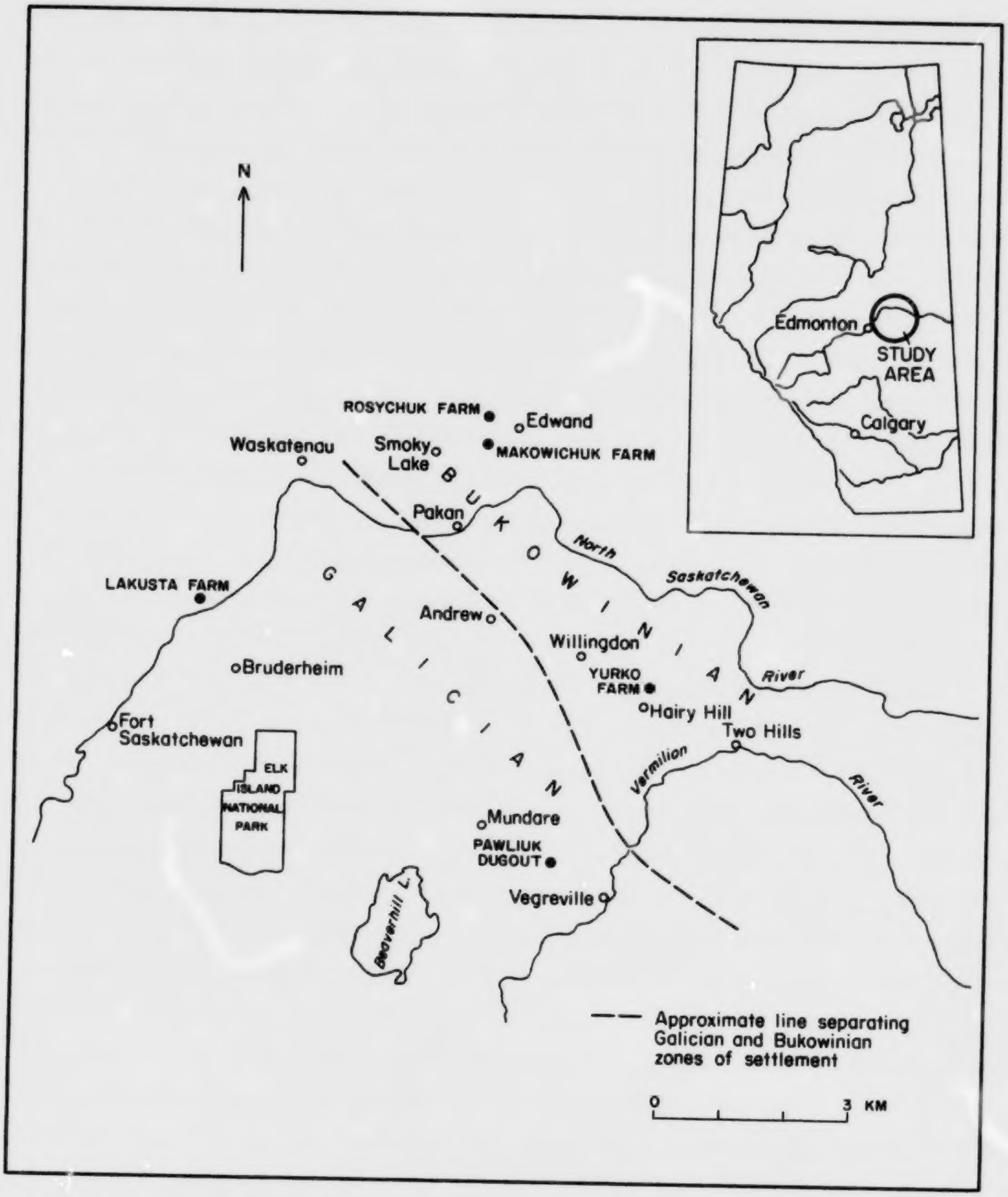

N
Edmonton
STUDY AREA
Calgary
ROSYCHUK FARM
Edwand
Waskatenau
Smoky Lake
MAKOWICHUK FARM
Pakan
B U K O W I N I A N
North Saskatchewan River
LAKUSTA FARM
G A L I C I A N
Andrew
Willingdon
Bruderheim
YURKO FARM
Hairy Hill
Fort Saskatchewan
Two Hills
ELK ISLAND NATIONAL PARK
Vermilion River
Mundare
PAWLIUK DUGOUT
Vegreville
Beaverhill L.
Approximate line separating Galician and Bukowinian zones of settlement
0
3 KM

Figure 2. Location of homestead sites in east-central Alberta.

homestead period and later farming era in Alberta. These archaeological assemblages would also be useful in the provision of a detailed description of the lifeways of these residents, thus enabling more accurate historical displays of material culture.

In 1983, excavations were conducted at a turn of the century Ukrainian Dugout site, commonly known as a "burdei" (Pyszczyk 1984a). This is a semi-subterranean dwelling which was used as a temporary shelter by early Ukrainian immigrants during their first year or two in Alberta. Investigations were also undertaken at the Lakusta (ca. 1901-1938) homestead near Redwater, Alberta (Pyszczyk 1984b). These excavations were primarily intended to collect architectural/structural information, but also to acquire an artifact and faunal assemblage from this early homestead site.

In 1984, three other homestead sites, Makowichuk (ca. 1904-1947), Rosychuk (1906-1929), Yurko (1930s-1950s), were examined to acquire both architectural information and an artifact and faunal assemblage. Investigations were also conducted at the Myrnam Blacksmith Shop site to collect information regarding the layout of the yard. Another dugout site, located north of Two Hills, was excavated in the fall of 1984 by ARESCO Ltd., under contract to the Archaeological Survey of Alberta. There are plans to examine more homestead sites in 1985.

The major emphasis of archaeological fieldwork at these Ukrainian sites was primarily to collect architectural/structural and landscape information for the village. However, it also provided an opportunity to sample a number of archaeological sites of one particular ethnic group, spanning a considerable time period in a relatively small region of Alberta. Such a collection of archaeological assemblages would eventually provide a basis to examine numerous anthropological/ archaeological problems dealing with early settlement and rural life in Alberta, as well as more general issues. The opportunity to investigate these sites also allows us to develop major research questions and specific methods of data recovery for such sites.

POTENTIAL METHODOLOGICAL DIRECTIONS

Before I begin to examine the archaeological characteristics of Ukrainian sites in rural Alberta, I will briefly discuss some of the more general research orientations for which this data base is most suitable. This statement implies that any archaeological data base has a unique set of attributes which makes it more useful to investigate some research questions over others. For example, a set of archaeological assemblages coming from a narrow temporal span and from one cultural group, but from a wide, diverse geographical region is better suited to examine questions of spatial cultural variability than questions of cultural change through time. Although this example is somewhat simplistic, it does point out that the data base must first be examined in its historical context to determine the sorts of research questions for which it might be most suitable. As I have stated earlier, my description of the archaeological potential of rural sites is by no means exhaustive; however, I have tried to focus on what I think are the best potential questions we can examine. I also wish to demonstrate that our ability to answer these questions will ultimately depend on how the archaeological remains are collected.

If one considers the entire settlement period in Alberta and its historical development, two major points become clear: 1) it generally consists of an adaptation by European immigrants to new frontier conditions over a relatively long temporal period enabling us to examine how they adjusted to the conditions and eventually modified some of them; 2) a number of different ethnic groups settled the province, adapted to the same conditions of the frontier, yet they maintained some semblance of their original ethnic identity. It is of considerable research interest to examine the processes of ethnic trait retention and loss. Thus, the major research strengths of the rural data base are the methods of adaptation and changes through time that various ethnic groups underwent in different parts of Alberta. The archaeological potential of these rural sites is great because we have control of many of the key variables needed to examine questions of adaptation, ethnicity, and acculturation. Furthermore, as a whole, these sites span a considerable temporal range covering the entire homesteading period in

Alberta, allowing us to examine these questions in the future with a representative archaeological data base.

Given the proper collection of archaeological data, a topic which will be discussed in detail later, a number of specific questions can be proposed for the Ukrainian settlement period in central Alberta. These questions could eventually be expanded to include other regions and ethnic groups in Alberta. For example, the major characteristics of the settlement period in central Alberta provide a good base to examine some of the more important questions of anthropology, in particular, those concerning how or why cultural groups maintain their identity, or why they change through time, or differ geographically. In addition, this data base is also very compatible with theoretical issues in historical archaeology, such as demonstrating how cultural patterns manifest themselves in material culture patterning and, eventually, in patterning in the archaeological record.

These historic events and specific characteristics of rural Alberta sites--namely, a strong regional ethnic data base over a relatively long temporal span--give some direction to the formulation of a conceptual framework in which to examine this segment of Alberta's history. The general research focus revolves around the questions of ethnicity, acculturation/assimilation, and why ethnic boundaries persist or are eventually broken down. Since the degree of ethnic identity is often so variable in minority groups, sometimes deteriorating quickly or sometimes increasing dramatically, it is important to demonstrate the circumstances under which such changes take place.

There are many models that have been proposed in recent years to account for the changes in stability of ethnic identity. They range from purely economic/ecological explanations (e.g., Despres 1975; Barth 1969), through models of opposition (e.g., Spicer 1971) and competition (e.g., Despres 1975) to models of political power (e.g., McGuire 1982). It is not my intention here to discuss the relevance of any of these models for Ukrainian groups at the present time. It is, however, important to demonstrate that regardless of the specific models that are eventually tested, two key elements must first be examined and measured in Ukrainian society. The first element consists of how ethnic identity changes in strength temporally or spatially, and the second is how such change might be measured archaeologically with certain attributes of material culture.

The above orientation, then, presently serves as the primary research focus of archaeological investigations undertaken for the U.C.H.V. Project. It requires that we begin by examining whether ethnic identity in Ukrainian societies has changed, using a range of variables found in Ukrainian society--namely, economic, spatial or social factors. Several specific questions might be examined:

1. How does Ukrainian ethnic identity change temporally in degree and rate in central Alberta? What types of customs/traditions are given up and what types are maintained? This question requires that Ukrainian acculturation be measured by examining Ukrainian material culture through time to determine what the degree and rate of change has been.
2. How stable is Ukrainian ethnicity spatially or regionally in central Alberta? This question asks whether greater interaction with other groups, either at boundaries between ethnic concentrations, or in cities, results in more rapid loss of traditional ways of life.
3. Does the degree and rate of ethnic identity and change differ in different Ukrainian income groups in Alberta? This question asks whether acculturation varies in families that are more economically prosperous.
4. How does the rate of Ukrainian acculturation in central Alberta compare to other ethnic groups in Alberta, or to Ukrainians in other parts of the province?

Posing such questions for archaeological inquiry places emphasis on the role that material culture plays in ethnic identity or acculturation. Padilla (1980) has proposed similar questions and models for ethnic groups in the southern United States. He examined whether the degree of cultural attrition was due to spatial, social, or economic factors. Obviously, in Alberta, we are far from testing or answering the above models and questions. However, such questions can presently serve as a focus for both the development of archaeological methodology and for planning future data collection at homestead sites.

The implications of the above problems for the collection of data are quite clear; both archaeological data and documentary data are necessary to examine them. But there are more far-reaching implications for the acquisition of archaeological data. The above questions imply that the farm site be the unit of archaeological measurement and comparison; however, an investigation of these questions will require rural sites covering a relatively long temporal period, and sites that span the entire geographical area and the entire economic range of that ethic group. The implementation of such a research program will first require compiling an inventory of various homestead sites in the province and then examining some of these sites archaeologically. Thus, a careful assessment of the full range of potential of this historic resource is a necessary first step for future planning and research purposes.

ETHNIC IDENTITY AND PATTERNING IN MATERIAL CULTURE

It is extremely difficult to determine what material culture attributes and archaeological measurements are needed to examine the above questions. It is in this area of archaeological research that a great deal of work is needed, and it is one of the more immediate objectives of the current investigations of Ukrainian homestead sites in Alberta. Historical archaeological studies of ethnicity and acculturation are still in their infancy in North America (Schuyler 1980) and have to date added little insight about the relationships between ethnic identity and material culture. For example, the most common methodological approach taken by historical archaeologists consists of identifying certain artifacts that seemingly typify or stereotype certain ethnic groups. Such studies are often limited and make little use of the archaeological data since many of those material goods that supposedly typify an ethnic group never seem to be well represented in the archaeological record (also see McGuire 1982). What is even more frustrating with this line of inquiry is that there is very little we can do analytically with such archaeological data; for example, so what if opium bottles are associated with Chinese sites? Certainly these identifications will never provide a sound basis to test such models and research questions as were proposed earlier. New potential directions for research are needed to develop measurements of material culture which can be used in a comparative manner in order to test the research questions. In other words, examination of ethnic acculturation cannot be conducted with only an absolute "identifying device", but requires a quantitative comparative measurement that is sensitive enough to measure temporal and spatial continuity in material culture assemblages. It is therefore important to first identify exactly how material culture is related to ethnic identity, and then to develop a measurement capable of monitoring stability or change in ethnic groups.

Perhaps the best way to overcome some of these methodological problems is to begin by defining what an ethnic group is and then examining what attributes in material culture might best measure change in the degree of ethnic group identity. Peterson-Royce's definition of an ethnic minority is used in this study:

> An "ethnic group" is a reference group invoked by people who share a common historical style (which may be only assumed), based on overt features and values, and who, through the process of interaction with others, identify themselves as sharing that style. "Ethnic identity" is the sum total of feelings on the part of group members about those values, symbols, and common histories that identify them as a distinct group. "Ethnicity" is simply ethnic-based action (1982:18).

According to De Vos (1975:374), ethnic identity implies sufficiently consistent behavior so that the individual is recognized by members within his group and identified by people outside his group. There are two important points regarding these definitions. First, if members of an ethnic group wish to maintain an identity distinct from the host group, then their behavior must differ to some extent from the host society. Second, this behavior must be relatively consistent within the group, so that the individual is recognized and accepted by members of his own group. It must be noted, however, that early Ukrainian settlers may be more than an ethnic group. Initially, at least, they were a distinct cultural group who shared not only a lifestyle that was overt or explicitly recognized by the group, but also shared beliefs and aspects of the lifestyle that were implicit and affected all parts of Ukrainian culture. The point at which the definition of culture group becomes ethnic group has important implications for measuring acculturation of immigrant populations.

Archaeological operationalization of these concepts to define ethnicity and to measure temporal and spatial regularity, requires the identification of a connection between group behavior/group identity and various forms of material culture patterning. If such a relationship generally holds--and numerous ethnographic and archaeological studies show that it does (e.g., Leone 1973; Deetz 1967)--then it should be possible to examine the degree of regularity of group behavior by measuring the degree of regularity in material culture in an archaeological context. For example, if the behavior of individuals within the group is relatively consistent and there is a high degree of conformity in the use of material goods, we should expect to see a greater amount of homogeneity in material culture patterning than if that behavior was quite variable. It is possible then to measure the degree of acculturation or ethnic identity of a group in two ways. First, one common model of group acculturation implies that as the group becomes more acculturated, the amount of behavioral variability will increase within that group since not all members have the same degree or rate of cultural attrition. Secondly, the relative differences in material culture assemblages between the ethnic group in question and the host society should continually decrease as acculturation increases.

Thus, in a conceptual sense, at least, a measure of variability of material culture of an ethnic group might best serve as a relative means of comparison, either temporally, economically or spatially. Yet to be determined are the specific attributes of material culture which best monitor behavioral regularity and the unit of analysis that is most adequate for comparison. As was mentioned earlier, past studies conducted on archaeological identification of ethnicity have used distinct types of material culture to symbolize differences between ethnic groups. Archaeologically, such artifacts may at best identify ethnic groups, but cannot be used for more intensive comparative purposes, e.g., to measure models of acculturation. This does not mean, however, that some physical attributes of material culture are not analytically useful. Indeed they are! For example, Lehr (1976) has shown that the traditional Ukrainian building styles change temporally in Alberta. Various attributes of building style change would certainly be amenable to testing various models of acculturation by measuring the degree of change in building design spatially, temporally, and economically.

Physical attributes of other forms of material culture are more difficult to use for analysis of ethnicity and acculturation, because since early in the 20th century, many goods have been mass-produced and do not display traditional stylistic attributes which might identify ethnic differences. It is therefore more difficult for a particular ethnic group to implant stylistic attributes on these items that might show ethnic or group distinctiveness. This avenue of research probably has very little analytical potential, similar to using specific objects to define ethnic groups, discussed above.

Although constraints on modification to any attributes of mass-produced products are considerable and therefore are less likely to show ethnic affiliation, this does not imply that a group has absolutely no choice of attributes of material items; their choice is manifested in the version of an item they choose, relative to the total range of possible forms of that item. A great deal more research is needed in this area, and archaeological assemblages collected from Ukrainian homesteads may very well provide such differences in selection of goods. Ethnicity could be expressed in the selection of specific attributes such as design, color, form and shape, particularly of items such as ceramics and glass, which permit a relatively large amount of choice in mass-produced items. These selections might very well show up archaeologically, and could potentially permit measurement of acculturation process, both temporally and spatially. We are just beginning to examine both the documentary record and archaeological assemblages for any signs of such patterning. If such attributes show up archaeologically, we can begin to measure the amount of inter-site variability that exists and whether it changes in a spatial or temporal manner.

Very little research has been conducted on identifying other potentially useful avenues to identify and measure ethnic differences or regularity. One possibility is the examination of various forms of spatial patterning, which could be very informative. For example, Leone (1973) researched Mormon town, yard and field plans, and Burley and Brandon (n.d.) examined the Metis concept and use of space. Thus, spatial patterning at the regional or site level (e.g., farm building layouts), or the spatial distribution of artifact assemblages at a site, might be a useful line of inquiry. With the proper mapping of Ukrainian homesteads and their archaeological samples, any potential regularity in the arrangement of material culture might become visible. Such types of data are currently being collected for Ukrainian homestead sites.

A final possible method to examine the degree of ethnic identity or change is one that measures quantitative regularity in the entire archaeological assemblage. Such an approach has been advocated by Sackett (1982) to examine the degree of behavioral variability or variability in group conformity evidenced in the material culture of prehistoric societies. The method should be by far the most thorough, comprehensive test of ethnic homogeneity because the entire assemblage of material culture is examined, which, in this case, should reflect all aspects of the behavior of a family at a farm. For example, imagine three families who use various types of material goods in a very similar fashion because of their similar ethnic backgrounds. If we examine the amount of difference between the percentages of each group of goods used, we should find a great deal more similarity in the use of material goods than would exist when those three families have experienced various degrees of acculturation. Such change should be archaeologically sensitive, and can be measured by computing the amount of similarity in the relative percentages of a number of artifact classes recovered from a sample of Ukrainian homestead sites. It is expected that this value would be:

1. highest when ethnicity or conformity in group behavior is highest;
2. lowest in sites displaying greater ethnic diversity or weaker ethnic identity.

Thus, values could be computed for a number of sites of an ethnic group residing in one region, and then be compared to site values for the same ethnic group residing in another region, or a different ethnic group in the same region. Values could also be computed for sites of an ethnic group from one period and compared to values of another period to determine temporal change in acculturation. Finally, values for various economic classes within an ethnic group could be computed and then compared.

The quantitative measurements necessary for the above comparisons would be designed to calculate the amount of variability within assemblages collected from a number of sites. However, the difference in the regularity of material culture between two or more site assemblages could also be compared. In some ways, because we have collected so few archaeological assemblages, this is presently the most practical approach to take. For example, if the quantitative regularity in relative frequencies within two assemblages of the same ethnic group were computed and the difference estimated, this value should be less than that obtained when two different ethnic archaeological assemblages are compared. The merits of this approach are currently being investigated with the archaeological assemblages collected from Ukrainian homestead sites.

To briefly summarize, the primary aim of this section has been to show some of the possible research questions that can be proposed for the settlement period in Alberta; the list presented here is by no means exhaustive. But perhaps even more important, this section has tried to emphasize the types of research that could be undertaken immediately on the whole question of ethnicity and acculturation and what sorts of data must be complied for each farm site examined. Much work is still required to find appropriate archaeological correlates and measurements to examine ethnic change and acculturation as reflected in material culture patterning. The few suggestions that have been presented here are essentially the beginnings of some analytical and conceptual approaches that will be examined with Ukrainian homestead archaeological assemblages in the future. There are also some very practical considerations of data collection at rural farm sites which are apparent from the previous discussion, summarized as follows:

1. the spatial arrangement of buildings at farm sites should be accurately recorded;
2. the sizes of buildings and construction details should be recorded, since these are valuable sources of information about ethnic construction and possible family wealth.

The collection of archaeological data is discussed next.

ARCHAEOLOGICAL DATA COLLECTION

One of the most sensitive and perhaps most critical issues is how to collect archaeological assemblages from homestead sites so they can eventually be used to test the proposed models and any other research questions that might be asked about the data base. The manner in which the archaeological data are collected will have some effect on the precision of the qualitative or quantitative measurements discussed previously.

The method of data collection that is eventually chosen will, to some extent, be dependent on how the archaeological record is formed, since formation processes affect both spatial distributions and frequencies of archaeological remains (Schiffer 1972). This implies that the general method of data collection is more dependent on site formation processes than on future research problems, as long as the data adequately represent the entire spatial range from individual activity areas to the entire site. In other words, adequate testing of any research problem is largely dependent on the precision of quantitative measurements. In turn, the degree of precision of all basic types of measurements--absolute frequencies, measurements of diversity, and proportional frequencies (Cannon 1983:785-6)--depends on the physical characteristics of the archaeological assemblages.

It is therefore essential to begin to describe the possible effects of site formation processes at homestead sites, as well as the spatial and quantitative characteristics of the artifact assemblages, in order to be able to choose proper sampling and analytical methods. To demonstrate the importance of these factors, the remainder of this paper examines the physical characteristics of homestead sites, and some of the fundamental problems in collecting homestead archaeological assemblages. Examples from the three homestead sites tested in 1984 are used to illustrate some of the points.

DESIGNING THE SAMPLING METHOD

A cursory examination of Alberta farms indicates that the majority of activities took place within or in the near vicinity of the farmyard and farm buildings. Here, artifacts were initially deposited from the everyday living activities, processing and storage of food, and the maintenance of buildings; these were sometimes removed to garbage dumps in specific areas. Given such a diverse range of activities over a relatively large area, it was initially assumed that it would be important to sample the entire yard, especially if various farmstead assemblages would eventually be compared. However, prior to any testing of such sites, the degree to which refuse from these activities was redeposited in a few specific areas of the site was unknown. Furthermore, the density and variety of archaeological remains was impossible to estimate without testing a number of sites. Quite often, it is assumed that archaeological assemblages are normally distributed and the corresponding sampling designs (particularly random sampling) are implemented to investigate them (Nance 1981, 1983). However, this is often not the case, and thus the sampling method and, invariably, the analytical techniques will suffer. These questions must be thoroughly examined, because the most appropriate sampling design for these homesteads will depend largely on the spatial distribution of the artifact assemblages. Some of the possible general depositional patterns of refuse density and types are illustrated in Figure 3.

Little thought was given to answering these fundamental questions in 1983 when investigations were undertaken at the Lakusta homestead; excavation units were placed primarily to recover structural information, leaving large areas of the yard unexplored. Such an approach now makes it difficult to examine the questions outlined earlier and will require that additional investigations be conducted at the site if it is to contribute to the defined research problems.

In 1984, investigations were modified to more systematically test an entire homestead farmyard. By using such an approach, more information was gained about the characteristics of the archaeological assemblages at these sites. The method used to test all three farm sites consisted of first defining a sampling frame which generally included all the farmyard buildings so that all activity areas could be examined. Since farmyard size often varied, the number of test units necessary also varied. A systematic sampling design was initially chosen so that all areas of the sampling frame were tested, because virtually nothing was known about the

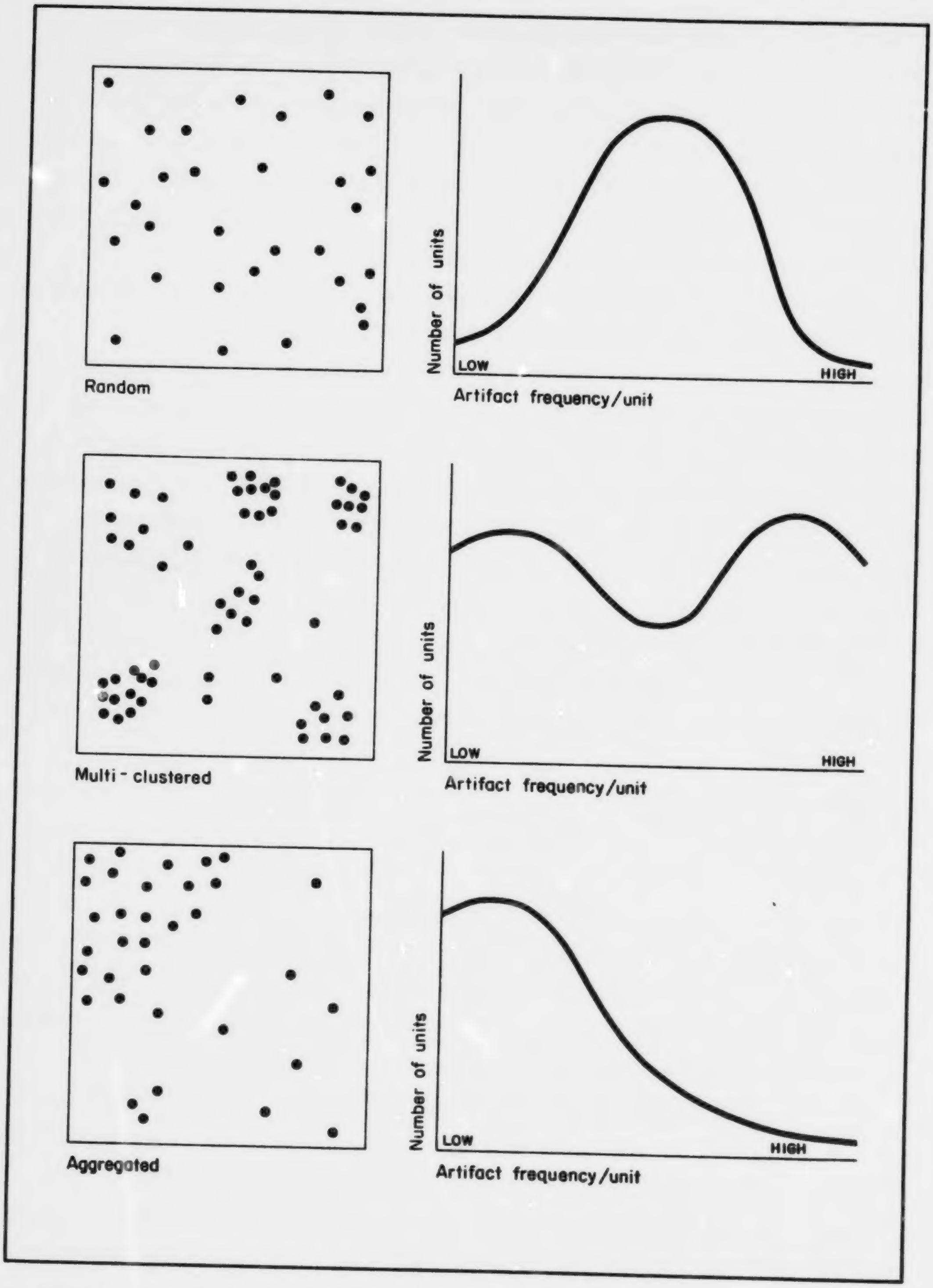

Random
Number of units
LOW
HIGH
Artifact frequency/unit
Multi - clustered
Number of units
LOW
HIGH
Artifact frequency/unit
Aggregated
Number of units
LOW
HIGH
Artifact frequency/unit

Figure 3. Hypothetical depositional patterns and associated frequency curves.

distribution of artifacts across these sites. A systematic method permits regular sampling of the entire study area and allows the artifact distribution to be easily identified and described. A series of 50 cm^2 test units were placed 5 m apart along line transects that were spaced 10 m apart. Units on adjacent transects were staggered, resulting in a systematic, unaligned sampling scheme (Mueller 1974). From 60 to 130 units were necessary at the sites tested.

Once areas of high artifact densities were identified, these were more intensively sampled, not only to acquire a larger artifact assemblage, but more importantly, to increase the precision of the sampling design (see Nance 1981); sampling precision will be discussed in detail later. There is a distinction between the manner in which the test units are placed over the site (here, a systematic sampling design), and the actual recovery of artifacts (either by cluster or element sampling). Nance most succinctly distinguishes these as follows:

> A statistical population is a group of things (items, observations) about which certain information is desired. The individual members of the population are elements. The population consists of the totality of elements relevant to a particular question under investigation. The property of interest in the population is referred to as a (population) parameter. Simply put, the objective of statistical sampling is to select a segment (sample) of the population according to a specified procedure, make observations about the population parameter as represented in the sample, and then to make an inference about the population parameter based on the properties of the sample. The members of the sample are sample elements and the sample counterpart of the parameter is a sample estimate. If the elements occurring in the sample are selected independently of each other, the sample is said to be an element sample. If the elements are selected in groups (clusters), the sample is called a cluster sample.
>
> Normally site sampling entails construction of a grid over the site surface, and exploration of the cultural deposit is accomplished by utilizing the grid squares as primary sampling units. It is important to bear in mind that under these circumstances we are concerned with two populations: 1) the population of grid units and 2) the population of cultural items in the site. Grid units are normally selected by element sampling; cultural items are recovered by cluster sampling (1981:51).

Grid units at the Ukrainian sites were selected by element sampling, while cultural items within these units constituted cluster samples.

With such a method, certain specific statistical procedures, and even sampling procedures, are required (Nance 1981:160); these will be discussed later. Although cluster sampling is less accurate for statistical prediction (Nance 1981) than selecting individual artifacts randomly, it is the most common and practical sampling method used at archaeological sites.

ASSEMBLAGE PHYSICAL CHARACTERISTICS

Probably the most fundamental factor that will affect the accuracy of the measurements needed to test cultural models is the distribution of artifact variety and frequency in the sampling frame (i.e., in this case, the farmyard). In this section, I will examine the artifact distribution patterns at the sampled homesteads with a number of quantitative methods capable of accurately measuring such parameters.

It became increasingly clear from visual inspection of the Ukrainian sites and from the test samples that the artifact densities were not randomly or evenly distributed in the sampling frame. Although the distribution of artifact variety was more difficult to assess visually, it generally tends to correlate with artifact frequency; that is, as frequency increases, so does variety, at least up to a certain point.

A more accurate method of measuring the distributions of artifact frequency and variety was to plot the frequency distributions of the three site assemblages. Assuming that the artifacts are randomly distributed over the site, a normal bell-shaped distribution curve should be evident. Examination of the artifact distributions from the three homesteads shows the frequencies are highly aggregated (Figure 4). The frequency distribution curve of two of the three assemblages is highly skewed to the right; the Rosychuk sample is also skewed, but relatively less so.

Nance (1983:305) indicates that whenever an artifact distribution is highly aggregated, the variance will always be greater than the mean. In this case, the variance of artifact frequencies is greater than the mean at all three sites (Table 2). The degree of artifact aggregation was also measured using the negative binomial equation shown in Table 2 (A). The results of these calculations are quite compatible with the other

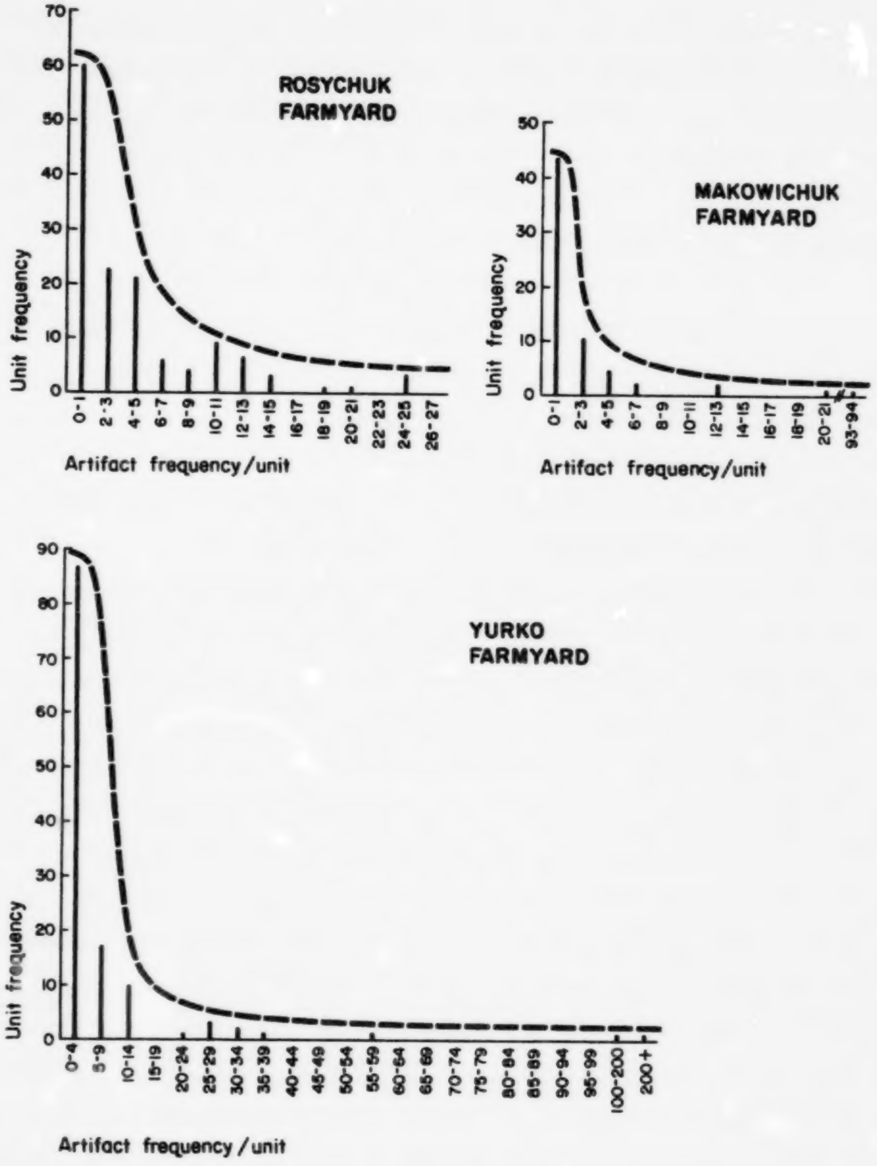


Figure 4. Artifact frequency distributions of three homestead sites.

Table 2. Results of statistical tests on Ukrainian homestead sites.

SITE	$\bar{X}$	s^2	A.	B.	C.
Makowichuk	3.4	152.20	0.078	85.50	0.26
Rosychuk	4.1	28.19	0.700	-	0.74
Yurko	6.5	530.47	0.081	187.16	0.30

A. $K = \bar{X}/(s^2-\bar{X})$ - the degree of aggregation of artifacts over the site.

0 = Highly aggregated artifact frequencies.
1 = Randomly distributed artifact frequencies.

B. $E(n) = xN/(a+1)$ - the number of 50 cm^2 test units it would take to discover garbage concentrations.

C. $\hat{p} = 1 - (\bar{X}/s^2)^k$ - The probability of finding an artifact(s) in one test unit.

measures of aggregation that were used; all assemblages were aggregated, but the Rosychuk sample tended toward a more random distribution with this calculation.

These results indicate that two of the three farm sites have highly concentrated artifact assemblages, primarily due to the occurrence of major refuse concentrations in localized areas of the yards. At the Rosychuk site, however, the lower value for the degree of aggregation is due to the more widespread scatter of artifacts, although even at this site, there was a 50 cm^2 area that had very high artifact frequencies in comparison to samples from the rest of the site. This scatter resembled sheet midden. It is therefore apparent that in order to ensure an adequate sample of artifacts from farm sites it is essential that such refuse concentrations be located by initial testing procedures and then more intensively sampled; more will be said about such sampling later.

The results of investigations at these farm sites also allow an estimation of how many test units (50 cm^2) must be excavated before a major refuse concentration is located. This figure can be obtained by computing the discovery probability (Johnson and Kotz 1969:157) for the farm site data. This expression considers the size of the sampling frame or number of units in the sampling frame and the size of the garbage concentrations; from these data, it is possible to predict roughly how many units would be needed to find these refuse areas. The results from this calculation (Table 2B) indicate that, on the average, it would take between 85 and 187 50 cm^2 units to locate major refuse accumulations at the two farm sites that yielded such features. However, this figure would be much lower where refuse was scattered but still concentrated over a larger area, such as at the Rosychuk farm. Thus, the number of units necessary to adequately test homestead sites should be determined for each individual site, and is dependent on the size of the farmstead or sampling frame (i.e., the total number of grid units in the frame), and the type and size of refuse concentrations at those sites.

The probability of discovering any artifact type in a specific test unit is also dependent on the degree of artifact aggregation at homestead sites (Nance 1983:316). For example, in the three sites examined here, the probability of discovering one or more artifacts of any type in a unit ranges from .26 - .74 (Table 2C). The probability of finding an artifact is highest at the Rosychuk site, where artifact aggregation was less pronounced. However, an examination of the probability of finding a certain type of artifact with one test unit is somewhat sobering. For example, at the Makowichuk farm, the probability of finding ceramics with only one test unit is .06, i.e., extremely low. This probability is somewhat larger at the Rosychuk farm since artifacts are not so highly aggregated at that site. The point to keep in mind here is that the probability of finding either any type of artifact or a particular artifact type, is largely dependent on the degree of artifact aggregation that occurs at the site, a factor which in turn affects the number of units needed to test the site.

It is all too apparent from the above results how estimation of absolute assemblage density or artifact type density can become biased if the sampling procedure is inadequate. Since artifact density is one of the basic measurements commonly used in archaeology, there can be little doubt about the importance of data recovery methods. The problem is even more serious when the frequencies of individual artifact types are examined, as shown above. Not only may the estimated frequencies of artifacts classes be biased, but an estimate of artifact diversity (another basic archaeological measurement) may also be adversely affected.

Another major problem with archaeological sites that have highly aggregated artifact distributions is that the quantitative precision (absolute frequencies, artifact proportional frequencies, and artifact diversity) is more difficult to attain unless additional sampling is conducted. Nance (1981:169) has suggested that high artifact density sites or areas of sites must be more intensively investigated if the precision of the sampling design is to be increased. Therefore, given that the greatest variety of artifacts exists in a few highly concentrated areas at the Ukrainian farm sites, true estimates of artifact relative frequencies, variety, or absolute density require an additional sample to be taken from high artifact density areas. For example, the variety of artifact types represented at both the Makowichuk and Yurko sites was increased dramatically when additional samples were taken from high density areas (Table 3); similar data are currently not available for the Rosychuk farm. Furthermore, the relative proportions and frequencies of artifacts at both sites change considerably when the additional refuse concentration sample is included (Table 4). Although I will not delve into the subject of sample precision any more intensively here, Nance (1981:164) points out that higher artifact density will result in less sample precision because larger artifact cluster sizes will result. It is therefore important to sample such concentrations more thoroughly to counter the effect of larger clusters and to increase the sampling precision.

It was mentioned in the previous section that the degree of quantitative regularity in the proportions of artifact types in homestead assemblages could potentially be an effective index of cultural continuity or change. Regardless of the specific attributes chosen for comparison, or whether whole assemblages are divided into groups and then compared, the precision of these comparisons will depend on how the assemblages are collected from these sites. For example, if relative proportions of artifact classes can be shown to be more similar among Ukrainian families than between Ukrainian and other ethnic groups, we have some comparative method for measuring ethnic differences. It should

Table 3. Comparisons of artifact types in refuse dump vs. yard.

SITE	METAL	OTHER
MAKOWICHUK		
-artifact types in common	17	3
-artifact types not in common	2	31
YURKO		
-artifact types in common	9	8
-artifact types not in common	14	10

Table 4. Comparison of artifact importance to area.

	r_s Values	
SITE	METAL	OTHER (ceramics, glass, etc.)
MAKOWICHUK (Yard to Refuse)	0.3722	0.2567
YURKO (Yard to Refuse)	0.2416	0.4368

RANK TEST: $1 - \frac{6\Sigma d^2}{n(n^2-1)}$

0 = no relationship

1 = high relationship

be clear by now that the accuracy of such comparisons will be affected by the manner in which the artifact assemblages have been collected.

To briefly summarize then, archaeological artifact types and densities at homestead sites are more or less aggregated distributions. Even at the Rosychuk homestead, where the assemblage was less spatially clustered, some areas of greater artifact concentrations were evident. In the highly aggregated artifact distributions with major refuse concentrations, such as the Makowichuk and Yurko sites, distributional differences in the variety, density and relative importance of artifacts will occur. In other words, the refuse concentrations cannot be assumed to represent the entire site nor can the farmyard sample alone be assumed to represent the entire site, since both artifact populations are quite different. This does not imply, however, that both assemblages are mutually exclusive and have been formed by the deposition of separate refuse from separate activity areas. The highly concentrated areas contain many elements that are found in the rest of the yard, although the opposite is not true. That is, household trash is deposited in refuse pits, but is found in very low numbers in the rest of the yard. This feature places increased importance on finding those refuse concentrations, and also implies some important limitations on what inferences can be made from artifact assemblages recovered from primary and secondary refuse areas (South 1977).

IMPLICATIONS FOR FUTURE SITE SAMPLING

What, then, are the best ways to sample and use archaeological assemblages from homestead sites? That, of course, depends on whether future investigations will verify that artifact distributions at the majority of homestead sites are highly aggregated. This is a very crucial point because if the assemblages turn out to be more randomly distributed, or show some other distributional pattern, other site sampling methods may be more appropriate. It is necessary, therefore, to monitor initial test results in the field or examine artifacts on the surface of ploughed sites to gain an initial indication of the spatial distribution of these assemblages.

It is hypothesized that, in all likelihood, farm sites generally have highly aggregated artifact distributions which are primarily the result of cleanup activities and secondary refuse disposal. Such assemblages are extremely difficult to deal with, both in sampling and in analysis. They yield less reliable estimates of artifact density, diversity and proportions since they have an exceedingly wide cluster size range and, thus, a very high variance. As Nance (1981) and others point out, simply increasing the sample size will not necessarily reduce the variance or increase the sampling precision.

Probably the best way to handle these problems is to stratify the sampling of the archaeological assemblage. For example, at the three homestead sites considered here, high density areas were investigated separately from other areas of the site in order to ensure a representative sample. These can then be treated separately analytically or incorporated in the total site sample. Any systematic testing procedure should enable stratification to be carried out in the field and additional, more intensive testing to take place in the high density areas.

A second way to increase the precision of data collection is to reduce the variability in cluster size (Nance 1983:163) by, for example, reducing the size of the test units. Such an approach would be effective where highly aggregated artifact assemblages occur. Furthermore, by reducing the unit size and increasing the number of units tested, the sampling precision can be increased since there is a better probability of finding high density artifact areas.

In addition, as Nance (1981:163) points out, areas having a high artifact density should be sampled more intensively to control variability in artifact cluster size more effectively (since artifact cluster size on the average will be larger) in dense areas (Nance 1981:163). By doing this, more sampling precision can be gained. Such an approach was taken during the 1984 field season, and likely resulted in a much more adequate sample.

The final point that must be made is that artifact types are also not randomly distributed over homestead sites. It would therefore be unwise to use a two stage sampling design such as, for example, dividing the sampling frame into four or even ten equal quadrats and collecting a random sample from one randomly selected quadrat. Since the artifact types and frequencies in each of the four quadrats are unlikely to be similar, such an approach would yield very unreliable results.

CONCLUSIONS

It has not been my intention in this paper to exhaustively describe the theory and use of sampling designs in archaeology. This subject has been quite thoroughly discussed by others (Nance 1981, 1983; Cochran 1963; Mueller 1974); I have simply applied the results of their work to archaeological investigations of homestead sites. An attempt has been made here to begin to describe the physical parameters of archaeological assemblages of homestead sites so that the best possible sampling method can be used. It is perhaps too early to be completely definite about a specific pattern of archaeological site formation and artifact distribution at Ukrainian homestead sites. However, if a highly aggregated spatial artifact pattern does exist, then the methods suggested above might be most useful to investigate these sites. At this time, with so few sites having been examined, it is probably most useful to continue to conduct preliminary investigations at each new site to determine how the artifact assemblage is distributed, and then to choose an appropriate sampling technique.

The other major purpose of this paper was to briefly describe the research focus that is presently being pursued with Ukrainian site archaeological assemblages and to illustrate some of the more far-reaching implications for such considerations as the future examination of these and other homestead site types; the potential research possibilities of these sites; the methodology needed to conduct such research; and the type of archaeological assemblages that must be collected to measure the models.

There are two major points with regard to these investigations that must be emphasized. First, I have tried to show how various measurements necessary to test models of ethnicity and culture change are affected by the way the archaeological record is collected. None of the potential for research at these homestead sites can be realized unless they are sampled properly. This will require a great deal more consideration of archaeological site formation processes that occur at early homesteads in western Canada, before the data recovery method can be chosen.

A second major point must also be emphasized, concerning the continued emphasis on attempting to define all potential research problems for a particular archaeological assemblage before the archaeological data are collected. It would perhaps be more productive to conduct research into site formation processes, leading to more efficient data collection so that important cultural models can eventually be investigated. The eventual testing of future models and research questions, no matter how many there are, ultimately depends on the three basic types of archaeological quantitative measurements proposed earlier, i.e., absolute frequencies, proportional frequencies, and artifact diversity indices. In this paper, I have attempted to illustrate what is perhaps already obvious - that the results from those measurements are seriously distorted unless the artifact distributional pattern is first thoroughly understood and described.

To conclude, there will be an ever-increasing interest in the early settlement period in Alberta. Anthropologists and archaeologists will be interested in such sites for pure research purposes and for more immediate salvage purposes of the archaeological resource before it is destroyed by development. Hopefully, the points made here will allow us to better understand this archaeological resource and to collect it in a fashion that will allow many potential research questions to be tested. If we act wisely now, we can avoid many future mistakes in data acquisition and thus preserve an unexplored, and potentially very useful, part of our cultural heritage.

SUMMARY

In this paper, I have tried to formulate a general research design for the investigation of Ukrainian homestead sites in Alberta. It is hoped that some of the issues that were examined will have broader appeal, since they are important to consider for the collection of data from other homesteads and other types of archaeological sites. I have tried to show the basic relationship between the broader research questions that can be asked and the data that must be collected from these sites. I have deliberately stressed that the manner in which data are collected is not necessarily dependent on the type of research questions that are asked. It is also important to consider the physical characteristics of archaeological site assemblages when collecting archaeological data. My main point in this paper is that, at this time, it is more important to better understand site formation processes and how these affect physical characteristics of specific types of assemblages and, further, how they might affect the precision of quantitative and qualitative measurements, rather than to try to formulate all the potential research questions that could be asked about the archaeological data base and attempting the impossible by trying to design the data collection to cover all the potential questions.

PARKS CANADA ARCHAEOLOGY IN ALBERTA, 1984

By
Ian Sumpter, Rod Pickard, Daryl Fedje, James White,
Lynda Gullason, Shawn Haley, and Sheila Robinson
Parks Canada, Western Region

INTRODUCTION

The Western Region Archaeological Research Unit of Parks Canada administered 89 projects in Alberta and British Columbia in 1984. Eighteen of these projects were in British Columbia, while 71 projects were located in Alberta. Of the Alberta projects, 43 involved historical resources impact assessments (areal and linear surveys and site assessments), 7 mitigations (salvage and conservation archaeology involving excavations) and 21 special projects (support activities, special studies, overviews and research (Table 5).

All projects were under the financial management and administrative responsibility of the Regional Archaeologist, Don Steer, of the Historical and Archaeological Research Section. Projects were completed through utilization of in-house resources, under contract, or through special agreements. The results of all assessments and mitigative projects will appear in one of three formats: 1) unpublished in-house manuscripts; 2) Parks Canada's Microfiche Report Series (MRS); or, 3) Parks Canada's Research Bulletin Series.

This paper presents brief summaries of the investigations and results of the major Parks Canada projects conducted in Alberta in 1984. These include a number of studies conducted in Banff, Jasper, Elk Island and Waterton Lakes National Parks, and at Rocky Mountain House National Historic Park.

Archaeological Investigations in Alberta's National Parks, Heritage Resource Salvage Program (Ian D. Sumpter)

During the 1984 field season, seven major archaeological programs were carried out by the Archaeological Research Unit's salvage crew within the boundaries of four National Parks in Alberta. Six of these programs involved heritage resource impact assessments (HRIAs) on various proposed development projects within Banff, Elk Island, Jasper and Waterton Lakes National Parks (Sumpter 1984, 1985a, 1985b). A preliminary highway HRIA study and site inventory was also undertaken by the salvage crew within Banff National Park, between km 26 (Sunshine Interchange) and km 47 (Castle Junction) of the Trans-Canada Highway (T.C.H.; Sumpter 1985c). In general, the objectives of the studies were to:

1. undertake heritage resource impact assessments in the various National Parks, on projects with potential impact to heritage resources;
2. identify, locate and assess both previously known and new heritage resources relating to the HRIAs; and,
3. provide recommendations for each heritage resource site regarding mitigative measures necessitated by the development projects.

With these objectives in mind, each project methodology involved a two-stage approach based on prefield and field studies. The former entailed a literary search and examination of site data files maintained by the Archaeological Research Unit and Regional Library, Parks Canada, Calgary; the Glenbow Alberta Institute, Calgary; the Archives of the Canadian Rockies, Banff; and the Archaeological Survey of Alberta, Edmonton. This information search was carried out to determine the extent of earlier research in the study region and the numbers and locations of previously recorded heritage resource sites associated by physiographic area as well as with individual development project areas. Prefield activities also included the examination of topographic maps, aerial photographs and development plans in order to acquaint the researchers with the project areas to be investigated and to assist in the assessment of the heritage resource potential of the area.

Field studies entailed a foot reconnaissance of project areas and significant peripheral areas in an attempt to identify known or new heritage resources. The extent of the field research was determined by the scope and nature of the proposed development project and its impact. For linear projects, such as road alignments and trail improvements, foot transects along the proposed rights-of-way were conducted. Due to time constraints, systematic subsurface inspections were limited to locales evincing moderate to high potential for site discovery. In most cases, a judgemental subsurface testing program was also employed within high potential areas. With respect to areal surveys, judgementally placed shovel probes were employed. Depending upon factors such as area, landform and matrix, surficial dimensions of the probes ranged in size from 40 cm to 60 cm per side. Existing exposures (rodent burrows, bison wallows, roadcuts, tree throws and erosional areas) were also examined to supplement shovel testing.

Banff National Park

During the period of July 3 - August 13, 1984, heritage resource impact assessments were conducted by a two person field crew on 18 development projects in Banff. The various projects included roadway improvement or construction developments, a ski development, primitive campground assessments, a townsite development, an entrance gateway improvement project, two borrow pits, two trails, one picnic site, an information centre development, and one historic feature assessment (Figure 5). In all, 5.66 km of linear survey and approximately 268.25 ha of areal survey were involved in the program.

Of the 18 proposed projects, eight revealed conflict with heritage resources. Of special heritage concern and value is the recently discovered Echo Creek Site, EhPv-78, a multicomponent site containing late prehistoric and historic assemblages. Due to the site's scientific research significance and the proposed development impact, conservation archaeological studies were conducted by the Archaeological Research Unit (see this report). A total of nine heritage resource sites were located, five known and four newly discovered (Table 6). It should be noted that the assessments and recommendations pertain only to site areas situated within the proposed development project right-of-way and that those site areas extending beyond the project zone require further assessment.

In October, 1984, a preliminary heritage resource impact assessment study and site inventory program was carried out between km 26 (Sunshine Interchange) and km 47 (Castle Junction) of the T.C.H. (Figure 5). A systematic foot reconnaissance (km 26-km 53.3) and shovel testing program (km 26-km 47) was conducted within the proposed highway right-of-way. As

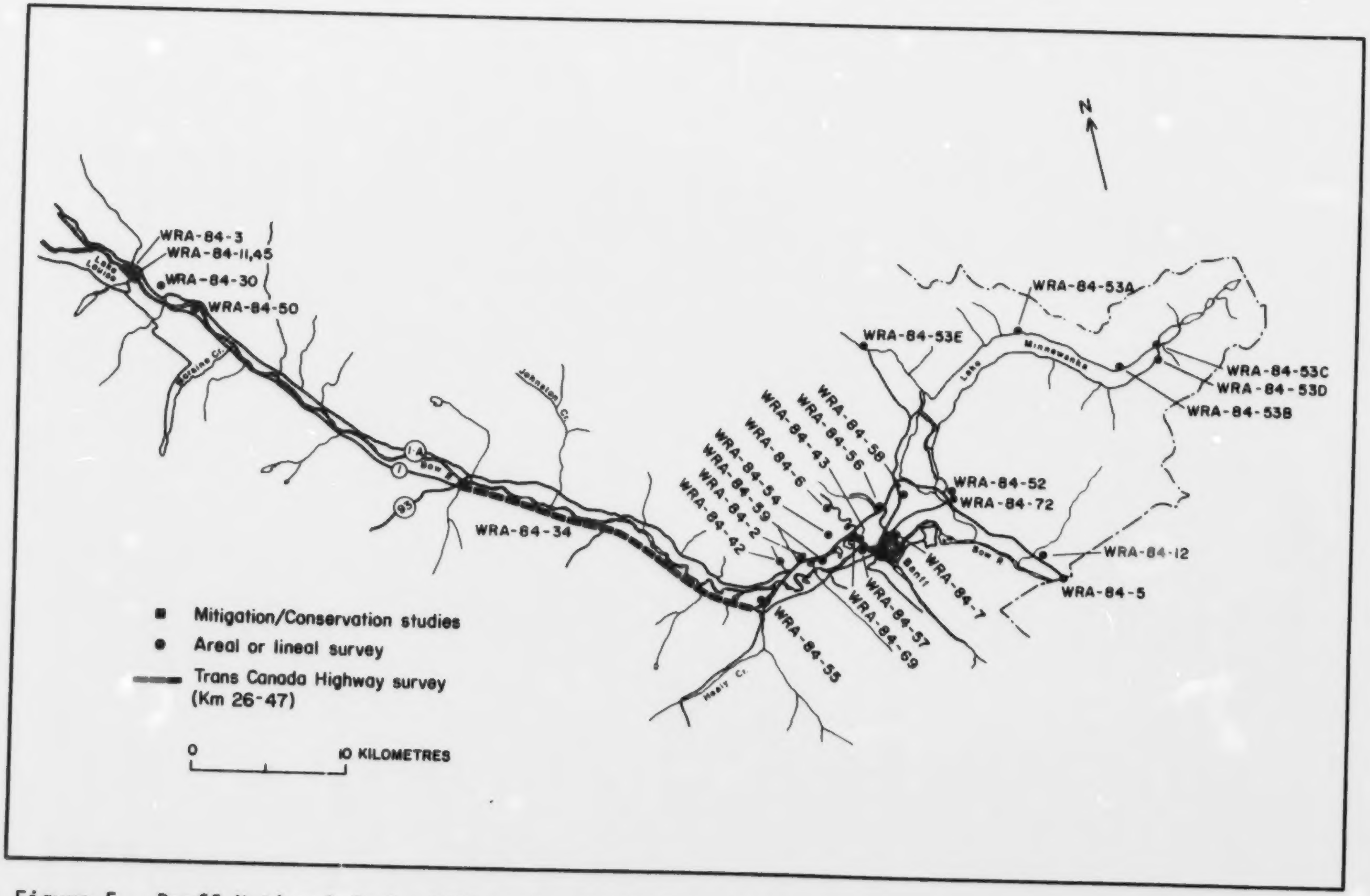

N
WRA-84-3
WRA-84-11,45
WRA-84-30
WRA-84-50
Lake Louise
Lorraine Cr.
Johnston Cr.
1-A
1
93
Bow R.
WRA-84-34
WRA-84-58
WRA-84-56
WRA-84-43
WRA-84-6
WRA-84-54
WRA-84-59
WRA-84-2
WRA-84-42
WRA-84-55
Healy Cr.
WRA-84-57
WRA-84-69
WRA-84-7
Banff
WRA-84-52
WRA-84-72
Bow R.
WRA-84-12
WRA-84-5
WRA-84-53E
Lake Minnewanka
WRA-84-53A
WRA-84-53C
WRA-84-53D
WRA-84-53B
■ Mitigation/Conservation studies
● Areal or lineal survey
Trans Canada Highway survey (Km 26-47)
0
10 KILOMETRES

Figure 5. Banff National Park, 1984 archaeological projects.

Table 6. Summary of sites assessed in National Parks in 1984.

Location/Project	Borden Number	Site Type
Banff National Park - HRIAs		
WRA-84-52	EhPu-6	Prehistoric campsite
WRA-84-52	EhPu-10	Prehistoric campsite
WRA-84-72	EhPu-21*	Prehistoric isolated find
WRA-84-54	EhPv-9	Prehistoric campsite
WRA-84-53	EhPv-16	Prehistoric campsite
WRA-84-59	EhPv-49	Prehistoric campsite
WRA-84-43	EhPv-78*	Historic commercial site/ Prehistoric campsite
WRA-84-57	EhPv-102*	Historic isolated find
WRA-84-55	EgPw-1*	Paleontological site/ isolated find
Banff National Park - T.C.H. Twinning Project		
WRA-84-34	EhPw-13*	Prehistoric quarry site
WRA-84-34	EhPw-14*	Paleontological site
WRA-84-34	EhPw-16*	Historic bridge footings
WRA-84-34	EhPw-17*	Paleontological site/ isolated find
WRA-84-34	EhPw-18*	Prehistoric campsite
WRA-84-34	EhPw-19*	Historic isolated find
WRA-84-34	EgPw-2*	Historic refuse site
WRA-84-34	EhPw-21*	Prehistoric campsite
WRA-84-34	EhPw-22*	Historic structural remains/ Prehistoric campsite
WRA-84-34	EhPx-27*	Historic site/isolated surface find
WRA-84-34	EhPx-28*	Historic site/surface find
WRA-84-34	EhPx-29*	Historic stone cairn
WRA-84-34	EhPx-30*	Historic stone cairn
WRA-84-34	EhPx-31*	Prehistoric campsite
WRA-84-34	EhPx-32*	Historic surface find
Elk Island Park - HRIAs		
WRA-84-22	FjPe-1	Prehistoric surface find
WRA-84-22	FjPe-2	Prehistoric campsite
WRA-84-19	FjPe-22*	Prehistoric surface find
WRA-84-22	FjPe-23*	Prehistoric campsite
WRA-84-22	FjPe-24*	Prehistoric surface find
WRA-84-68	FjPf-6	Prehistoric campsite
WRA-84-14A	FjPf-7	Prehistoric campsite
WRA-84-14A	FjPf-14	Prehistoric surface find
WRA-84-14A	FjPf-15	Prehistoric campsite
WRA-84-14A	FjPf-16	Prehistoric campsite

*Denotes site discovered during 1984 survey

Table 6 continued

Location/Project	Borden Number	Site Type
WRA-84-21	FjPf-108*	Prehistoric isolated find
WRA-84-14A	FjPf-109*	Prehistoric surface find
WRA-84-19	FjPf-110*	Historic surface find
WRA-84-19	FjPf-111*	Prehistoric surface find
WRA-84-68	FjPf-112*	Prehistoric surface find
WRA-84-14A	FjPf-113	Historic cabin remains
WRA-84-13	FkPe-2	Prehistoric campsite
WRA-84-13	FkPe-4	Prehistoric beach quarry
WRA-84-13	FkPe-7	Prehistoric beach quarry
WRA-84-13	FkPe-100*	Prehistoric campsite
WRA-84-13	FkPe-101*	Prehistoric campsite
WRA-84-15	FkPf-1	Prehistoric campsite
WRA-84-18	FkPf-48*	Prehistoric campsite
	FkPf-49	Historic residence
Jasper National Park - HRIAs		
WRA-84-28	FfQm-6	Prehistoric campsite
WRA-84-29	FgQk-1*	Paleontological site
Waterton Lakes National Park - HRIAs		
WRA-84-4	DgPk-34	Paleontological site
WRA-84-4	DgPk-40	Prehistoric campsite
WRA-84-60A	DgPk-87*	Prehistoric isolated surface find
WRA-84-60C	DgPl-3	Prehistoric base camp
WRA-84-78/60D	DgPl-8	Prehistoric base camp
WRA-84-60E	DgPl-9	Prehistoric base camp
WRA-84-60B/89	DgPl-10	Prehistoric base camp/ historic cabin remains
WRA-84-4	DgPl-19	Prehistoric campsite
WRA-84-4	DgPl-20	Rock cairn
WRA-84-4	DgPl-45	Prehistoric campsite
WRA-84-4	DgPl-48	Prehistoric campsite
WRA-84-4	DgPl-49	Prehistoric campsite
WRA-84-4/75	DgPl-78	Bison kill
WRA-84-4	DgPl-98	Prehistoric campsite
WRA-84-4	DgPl-100	Historic earth ring
WRA-84-4	DgPl-101	Prehistoric isolated surface find
WRA-84-4	DgPl-128	Prehistoric campsite
WRA-84-4	DgPl-137	Prehistoric campsite
WRA-84-60F	DgPl-140	Bison kill
WRA-84-89	DgPl-151	Prehistoric campsite
WRA-84-89	DgPl-152	Paleontological site

*Denotes site discovered during 1984 survey well, judgementally placed subsurface shovel probes were employed in moderate and high site potential areas.

The field methodology resulted in the discovery of 15 new heritage resource sites including two paleontological sites, four prehistoric sites, one of both historic/prehistoric period, and eight historic sites (Table 6). Eight of the 15 sites recorded were found to lie near the edge or within the proposed highway right-of-way.

Elk Island National Park

Eleven proposed development projects were examined by a two person field crew during May 24 - June 29, 1984 (Figure 6). The projects included four road alignments, three skiing/hiking trail improvements and/or construction, a recreational area improvement project, a picnic area and a parking facility with associated trailhead development and a kiosk replacement project. In all, 57 km of linear survey and approximately 71 ha of areal survey were involved in the program. Of the 22 heritage resource sites located (Table 6), 12 were previously known and 10 were new. Three of the 22 heritage resource sites (FjPe-2, FjPf-7 and FkPf-1) were found to be of special concern as they were assessed to be of high heritage value and in direct conflict with proposed development. Subsequently, conservation archaeological studies were carried out by the Archaeological Research Unit (see this report).

Jasper National Park

The Heritage Resource Salvage Unit carried out three HRIAs within Jasper National Park in early June (Figure 7). These included: two development projects, a road alignment and a hot pool facility construction, and one heritage site re-evaluation study (FfQm-6).

One new paleontological site was discovered (FgQk-1) during the trenching for the new Miette Hot Springs Facility. Well preserved faunal elements, tentatively identified as immature bear (Ursus sp.), were recovered from one isolated find spot, ca. 2.0 m below surface.

Waterton Lakes National Park

A total of seven development projects were examined by a two person field crew, August 13 - 31, 1984 (Figure 8). These land modification

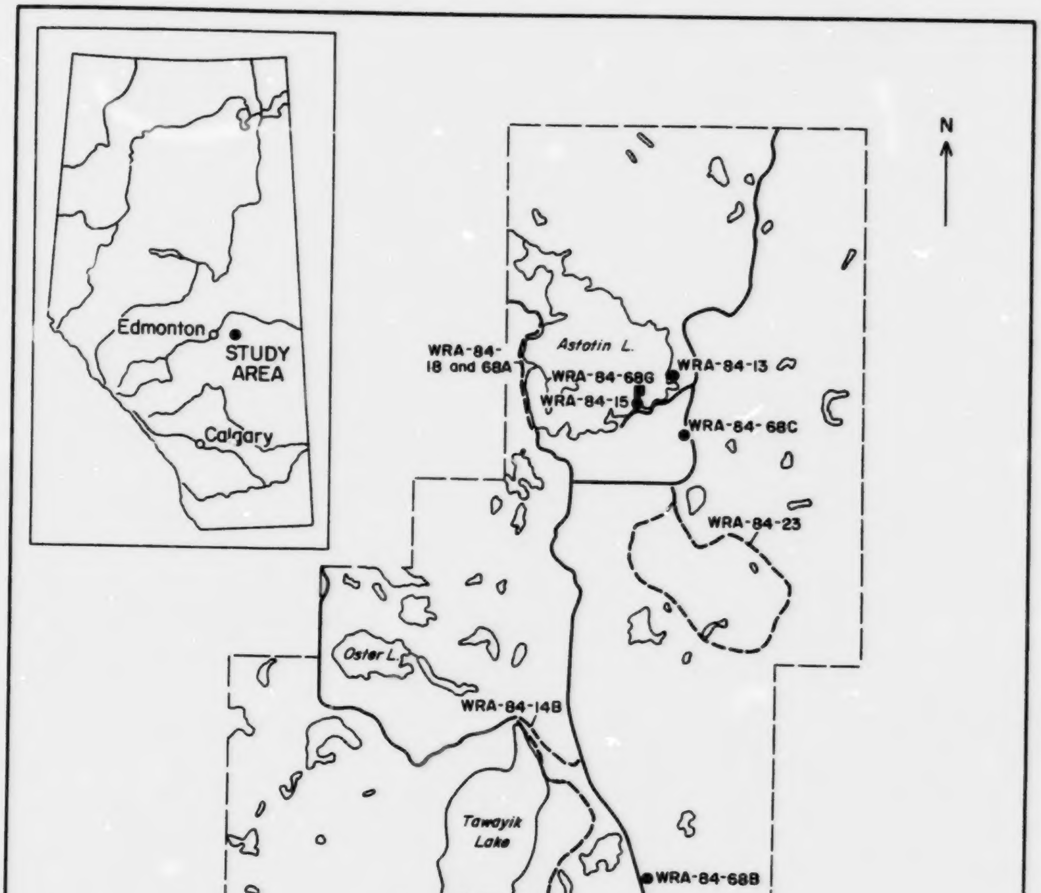

Edmonton
STUDY AREA
Calgary
N
Astotin L.
WRA-84-18 and 68A
WRA-84-68G
WRA-84-13
WRA-84-15
WRA-84-68C
WRA-84-23
Oster L.
WRA-84-14B
Tawayik Lake
WRA-84-68B
WRA-84-68D
WRA-84-14A
Little Tawayik L.
HWY 16
WRA-84-20
WRA-84-19
WRA-84-68F
Flyingshot Lake
WRA-84-21
WRA-84-68E
WRA-84-22
■ Mitigative/Conservation studies
● Areal survey
--- Linear survey
0
5 KM

Figure 6. Elk Island National Park, 1984 archaeological projects.

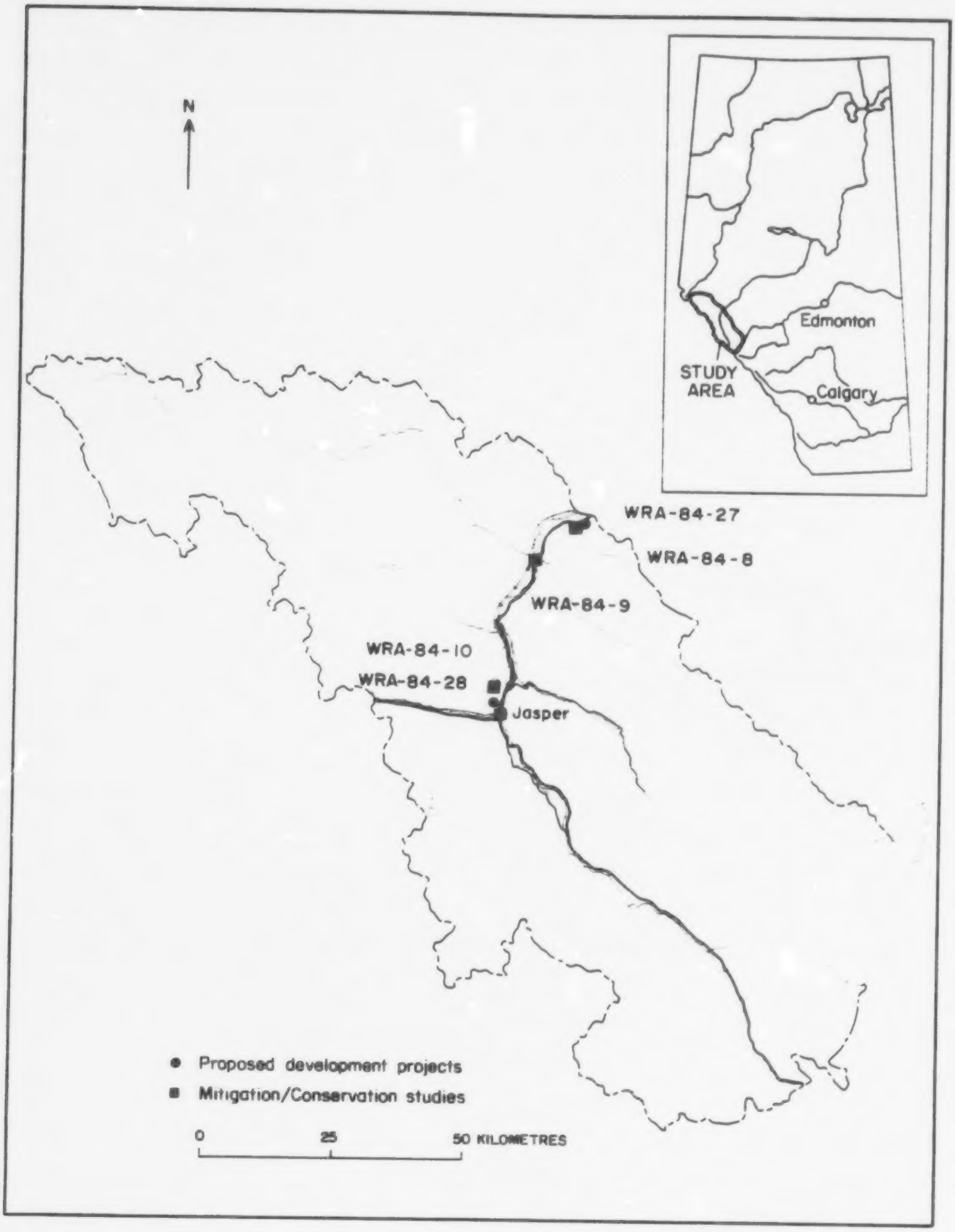

N
Edmonton
STUDY AREA
Calgary
WRA-84-27
WRA-84-8
WRA-84-9
WRA-84-10
WRA-84-28
Jasper
● Proposed development projects
■ Mitigation/Conservation studies
0
25
50 KILOMETRES

Figure 7. Jasper National Park, 1984 archaeological projects.

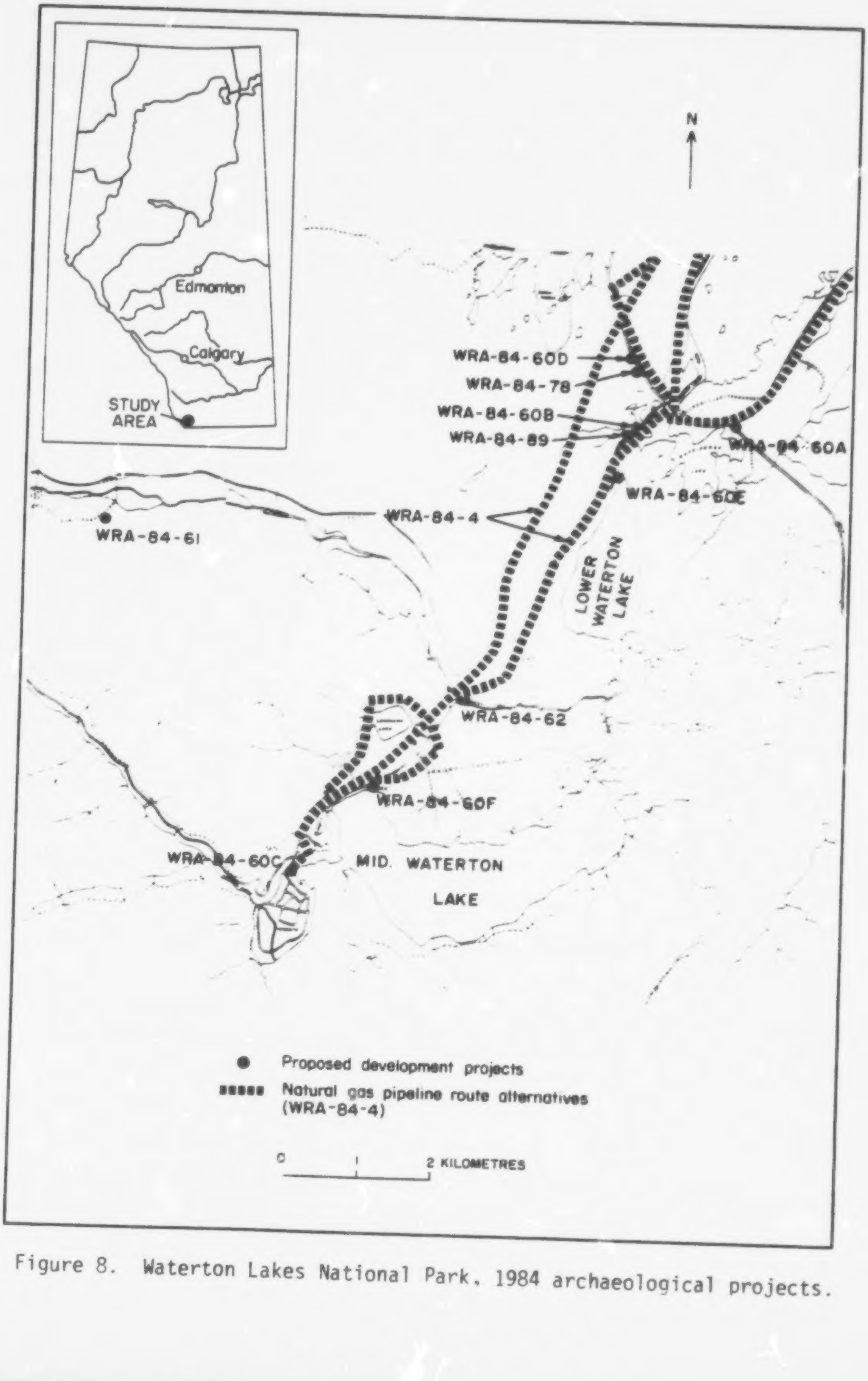

Edmonton
Calgary
STUDY AREA
N
WRA-84-60D
WRA-84-78
WRA-84-60B
WRA-84-89
WRA-84-60A
WRA-84-60E
WRA-84-4
WRA-84-61
LOWER WATERTON LAKE
WRA-84-62
WRA-84-60F
WRA-84-60C
MID. WATERTON LAKE
● Proposed development projects
▪▪▪▪▪ Natural gas pipeline route alternatives (WRA-84-4)
0 1 2 KILOMETRES

Figure 8. Waterton Lakes National Park, 1984 archaeological projects.

developments involved: a highway improvement project, a park's residence driveway expansion, a staff residence construction development, a temporary bridge replacement and detour, an oil spill disturbance assessment, a natural gas pipeline right-of-way overview, and an installation monitoring program.

In total, 25.65 km of linear survey and approximately 35.6 ha of areal survey were involved in the program. Five of the seven proposed projects were found to be in conflict with a number of heritage resources.

The impact assessment program located and assessed a total of 21 heritage resource sites: two paleontological, one historic, one historic/prehistoric and 17 prehistoric sites (Table 6). Eighteen of the sites were previously known.

Summary

The Heritage Resource Salvage Program 1984 assessed a total of 40 development projects proposed for four National Parks within Alberta. The impact assessment program entailed a two stage research study that involved the location and evaluation of 69 heritage resource sites (47 prehistoric, six paleontological, three historic/prehistoric and 13 historic period sites). The sites ranged from an isolated surface find to highly significant heritage resources. As nonrenewable resources, the latter are of considerable interest and heritage value.

Interim Report - Jasper National Park Historical Resource Assessment Studies (Rod Pickard)

The Archaeological Research Unit of Parks Canada, Western Region conducted historical resource assessment studies in Jasper National Park from June 26 to September 14, 1984. The studies involved two historic period sites, Pocahontas (ca. 1908 to 1921) and Jasper House (ca. 1830 to 1884), and two prehistoric sites situated on Patricia Lake (FfQm-26 and FfQm-34).

Pocahontas (FhQl-14)

Pocahontas is a historic coal mining area located along Highway 16 near the base of Roche Miette in Jasper National Park (Figure 7, WRA-84-8). Coal claims were staked in the area in 1908 and following completion of the Grand Trunk Pacific Railway in 1911, a mine and associated boomtown was established near the tracks. Jasper Park Collieries, the coal company which operated at Pocahontas, continued production until 1921 when the mine was closed due to labour, economic and production related problems.

In 1983, the Archaeological Research Unit completed preliminary inventory activities at Pocahontas, concentrating on the identification of significant historic period remains. It was noted that relic collecting activities represented a major problem and were reducing historical resource values of the site. Following the 1983 recommendations, an assessment program was initiated in 1984 to mitigate the loss of material culture remains from a major refuse dump associated with the occupation period. The refuse dump was found to cover a 900 m^2 area within a dense stand of poplar and spruce near Punchbowl Falls. The dump was investigated over a three week period, during which three 1 m x 2 m tests and two 1 m x 1 m tests were excavated. The dump was divided into 5 m square blocks, and it was extensively photographed from recorded reference points to inventory metal containers and other artifact types. This proved to be a successful approach for processing the high numbers of artifacts encountered during excavation. Approximately 130 metal container types, a large sample of faunal remains, ceramic and glass fragments, a variety of metal fasteners and a number of miscellaneous artifact types were recorded and brought back for detailed studies. The results of artifact studies, now in progress, should aid in the interpretation of the coal mining story at Pocahontas. A detailed report on the 1984 studies will be available in late 1985.

Jasper House (FgQl-1)

Jasper House is situated on a silt capped river terrace on the west bank of the Athabasca River some 37 km downstream from Jasper townsite (Figure 7, WRA-84-9). Jasper House was constructed at this locale in 1830, in a move from an original location on Brule Lake. The site was utilized primarily as a supply depot for exploiting the Columbia and New Caledonia fur districts. Fur brigades travelling from Fort Assiniboine on the Athabasca River obtained provisions and horses at Jasper House for crossing the mountains into British Columbia. The area around Jasper House, commonly known as Devona Flats, offered good winter grazing for the horses. The site continued to be used to a lesser degree as a trading post until about 1884 when it was finally closed (Morton 1973). According to Stuart (1985), the structural history of Jasper House is marked by three building phases: in 1830, 1858 and the 1890s. The 1830 phase was associated with relocation and establishment of the site by Michael Klyne; the 1858 phase was associated with rebuilding by Henry John Moberly; and the 1890s phase was marked by utilization of the site by Louis Swift, an American homesteader. Jasper House was designated a National Historic Site in 1927.

A five person crew from the Archaeological Research Unit carried out investigations at the site from July 23 to August 24, 1984. The purposes of the project were to assess the impact of relic collecting activities, map historic period remains, examine the integrity of building remains through test excavations and document structural history. The site was extensively photographed and mapped during initial studies. All material was screened through 1/4" mesh during excavation. Two separate building locations, two refuse pits and a potential high use area next to the river were test excavated. The entire clearing was gridded and examined with a metal detector. Visual historic features including four chimney mounds, three and possibly four building outlines, a cemetery and other small depression features were recorded.

Assessment studies indicated that relic collectors had disturbed a significant refuse pit and chimney mounds and collected significant remains from the cemetery and other parts of the site. Testing of the buildings indicated that wood remains of one building clearly delineated the orientation and construction technique. Testing of the second building demonstrated that the structure was largely charred and more difficult to interpret. A large sample of ungulate bones was obtained from a small cultural feature. A range of faunal materials, square nails, beads, cartridges, clay pipe fragments and other assorted artifacts were found in a large refuse pit. An assortment of historic artifacts was found during testing of the two buldings (mainly beads, cartridges, faunal materials).

Jasper House represents a significant historical resource within the park. Investigations at the site suggest that the site encompasses a number of relatively undisturbed structures and features. Artifact analysis and faunal analysis is presently ongoing. The final report will contain detailed descriptions of the 1984 field investigations and will be completed in 1985. Approval has already been granted for further investigations at Jasper House in the summer of 1985.

Patricia Lake (FfQm-26, FfQm-34)

These two prehistoric sites are situated at the northeastern end of Patricia Lake on the Pyramid Bench above Jasper townsite (Figure 7, WRA-84-10). Both sites were discovered in 1983 during inventory and historical resource assessment studies. Site FfQm-26 is located on an undulating morainal surface overlooking the lakeshore, while FfQm-34 is located within a day use area across the Pyramid Lake road from FfQm-26.

The 1984 program was designed to provide information for the environmental assessment and review process within Parks Canada in light of upgrading the Pyramid Lake road and the day use area at some future date. Construction work was commenced on the road in 1984 and was completed from Jasper to Cottonwood Slough. Investigations were conducted at the sites from August 20 to September 14, 1984. The objectives of the program were threefold: to determine the spatial limits of the sites; to determine temporal and cultural associations; and to determine site significances.

The testing program at FfQm-26 was initiated by establishing a 10 m grid. Initially, all test units were trowelled and hand sorted, but later, all matrix was screened through 1/4" and 3/8" mesh screens. A total of 150 test units were excavated, and 71 yielded lithic artifacts. A large variety of artifact and material types was identified at the site. Artifacts were found to cover an estimated 12,000 square metre area, within which three distinct artifact clusters were delineated. Stratigraphy at the site was compressed, and most artifacts clustered in the upper 20 cm of soil matrix. Artifacts tended to be associated with a reddish soil horizon of a lutric brunisol. A 10 m^2 block excavation produced significant amounts of lithic debitage, unnamed stemmed, side notched and corner notched projectile point types (approximately 10 specimens), and miscellaneous tool types. During the testing program, a significant number of gravers were identified. No radiometrically dateable materials were found during the testing program.

Test excavations at FfQm-34 yielded 63 lithic items, comprised mainly of quartzites, quartz crystal and siltstone. A total of 37 shovel tests were excavated, and all sediment was screened through 1/4" mesh screens. Eight lithic tools and 37 utilized flakes were identified during artifact analysis. Particularly noteworthy was the base of a lanceolate point resembling the Lusk or Agate Basin types.

The lack of temporally diagnostic artifacts and dateable materials represents a major interpretive drawback of the sites. However, in view of the lack of excavated materials in Jasper National Park, both sites have added significant information. Further investigations at the sites will depend on road development and other upgrading plans. A detailed report on the 1984 program will be completed.

Archaeological Investigations in the Vermilion Lakes Area of Banff National Park (Daryl Fedje)

Parks Canada is currently completing the final year of a three year program of research and mitigation in response to the twinning of the Trans-Canada Highway along the heritage resource rich landforms north of the Vermilion Lakes in Banff National Park (Project WRA-84-2). This report will provide a very brief synopsis of activities conducted during 1984. Four prehistoric sites were investigated during 1984 (Figure 9). These included the Edith Trail Site (EhPv-5), the Five Mile Creek Site (EhPv-7), the Vermilion Lakes site localities A (EhPv-8) and B (EhPv-51) and the Beach site (EhPv-72). Because analysis of 1984 data has just recently begun, only a few preliminary comments will be offered.

The study area is situated on the north side of the Bow River valley in a narrow swath of gently sloping landforms between the Vermilion Lakes wetlands and the abrupt slopes of the Sawbuck Mountain range. The sites documented herein all lie within the Montane ecoregion, and each occupies a unique biophysical setting within these bounds.

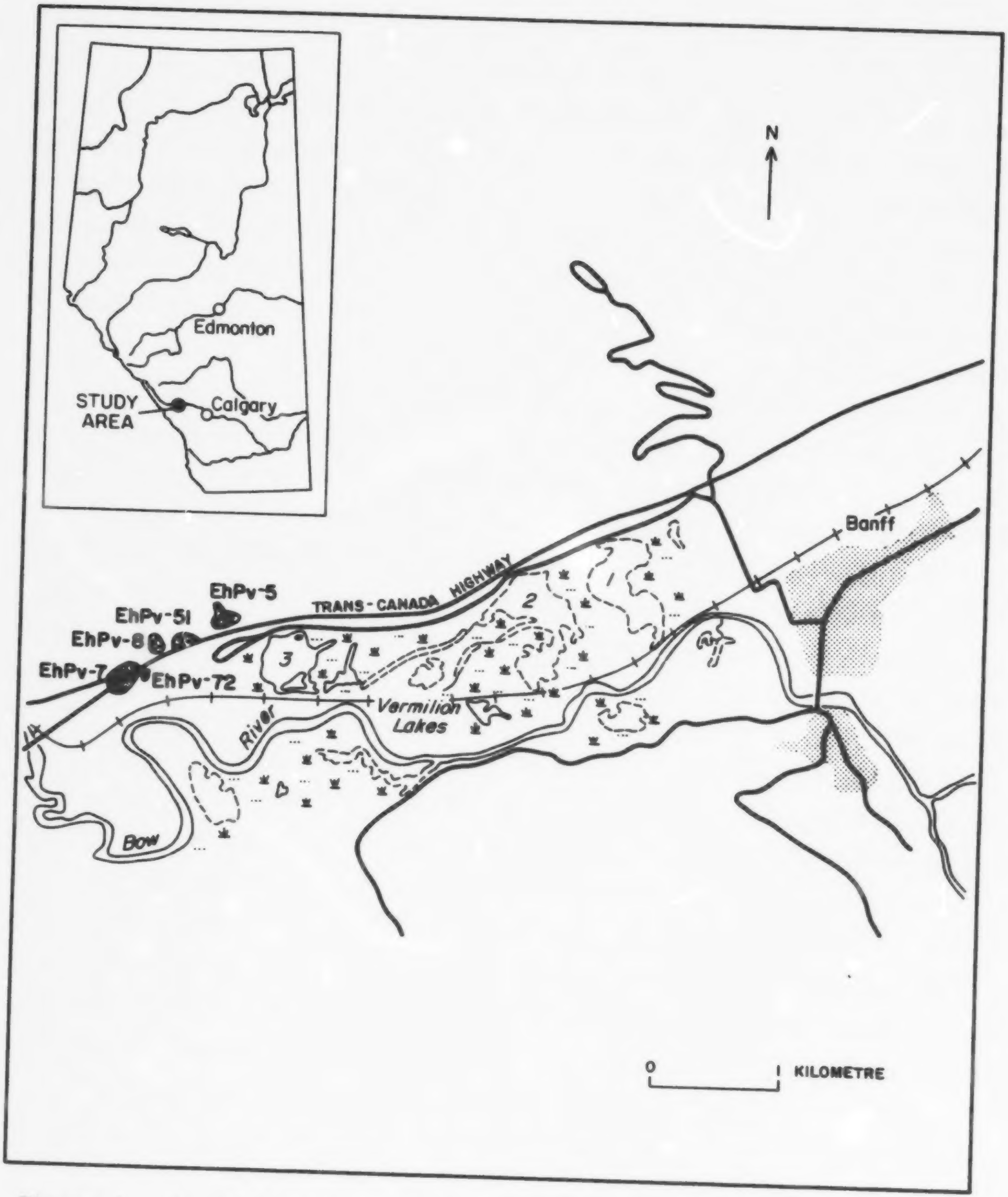

Edmonton
STUDY AREA
Calgary
N
Banff
TRANS-CANADA HIGHWAY
EhPv-5
EhPv-51
EhPv-8
EhPv-7
EhPv-72
1
2
3
Vermilion Lakes
Bow River
1A
0 1 KILOMETRE

Figure 9. Vermilion Lakes study area, Banff National Park.

The Edith Trail Site (EhPv-5)

This prehistoric site is situated on an aeolian capped alluvial fan some 300 m north of the modern margin of the Vermilion Lakes Wetlands. A systematic deep test excavation program in concert with backhoe testing exposed two prehistoric components. One was associated with the "modern" luvisol, and one was buried by approximately 1.5 m of alluvial gravels and alluvial and/or aeolian silts. Intensive systematic testing and block excavations were subsequently conducted in areas evincing the greatest concentrations of prehistoric material.

The upper component was present discontinuously across the approximately 10 m x 100 m impact zone. Material culture remains recovered from this component were limited to a few formed tools and a quantity of debitage. Black chert was the dominant material type present.

The lower component was apparently very limited in extent. It was associated with a relatively thin silt layer existing only in a few small areas within the proposed development zone. Alluvial cutting subsequent to deposition had removed most of this silt member. Again, only limited material culture remains were recovered. Concentrated within a ca. 3 m^2 area was a quantity of black chert debitage derived from lithic reduction activity. No tools were identified in field. Organic preservation was limited to a small quantity of charcoal.

The Five Mile Creek Site (EhPv-7)

This prehistoric site is situated on a substantial aeolian feature overlying an alluvial fan near the eastern edge of the Vermilion Lakes Wetlands. Mitigation was essentially completed during 1983 (Fedje and White 1984). Activities at this site in 1984 were limited to deep backhoe trenching for interpretation of the landform itself and surface collection of the development area subsequent to clearing and grubbing. A quantity of lithic detritus, tools and a few diagnostic artifacts were recovered.

The Vermilion Lakes Site (EhPv-8, 51)

This prehistoric campsite is situated at the toe of a debris-flow fan (colluvium/alluvium) and fronts directly on the marshy perimeter of the Vermilion Lakes. The site includes two localities separated by about

100 m of terrain. No intensive testing or deep testing has been conducted between the two localities, but it is probable that the cultural strata will extend across this area. During the 1983/1984 fiscal year, a substantial effort was carried out at this site with a focus on the western locality (A). The results of this program (Fedje and White 1984) indicated the site to be deeply stratified, containing evidence for nine periods of human activity over the past 10,000 years. In 1984, work was concentrated at the eastern locality (B) but also included some additional excavation at locality A. Excavations at locality B were initiated in the late winter (February 1984) and completed in the summer months. A total of approximately 50 m^2 (100 m^3) was excavated, by both systematic deep testing (1 m x 2 m and 2 m x 2 m units) and block excavation. In addition, four backhoe trenches were excavated deep into the landform for biophysical interpretation. Within this context, two prehistoric components were identified. Both lie within the massive silts overlying early post-glacial colluvial and alluvial deposits.

The upper component was associated with the "modern" luvisol at 10 to 30 cm below the present land surface. While analysis has yet to be completed, field inspection of the assemblage tentatively suggests a Late Middle Prehistoric time frame. Recovered material culture consisted of some 1800 lithic items including five projectile points, a number of tools and a large quantity of debitage (over 1750 items). A small amount of poorly preserved bone was also recovered. Several of the projectile points compare most favourably with the Pelican Lake corner notched type but detailed analysis and/or radiogram dating is necessary prior to a firm identification. No intact features were noted and it is likely that this component is at least partly turbated. That a single component may be represented is suggested by the horizontal distribution of the assemblage (i.e., approximately 90% of the upper component lithic assemblage including all projectile points, was recovered from a ca. 10 m^2 area in one part of the site) and the similarities within the projectile point assemblage.

The lower component was associated with a very weak regosol at 140 to 150 cm below the present land surface. An Early Prehistoric Period time frame is suggested by the recovery of a large lanceolate projectile point. Approximately 90 additional lithic items were recovered from this component including a few tools and a quantity of debitage. All of the cultural remains comprising the lower component were recovered from a roughly circular area of about 3 m in diameter. Associated with this concentration was a thin scattering of charcoal fragments. No bone was recovered. It is noteworthy that there appear to be close similarities to the lower components of the locality A (Fedje and White 1984). For example, the lithic material types and technology are virtually identical to that observed in component 8 (ca. 9,400 B.P.) at locality A and the projectile point is similar to that recovered from component 6 of the same locality.

Excavations at locality A were conducted during the late summer of 1984. A total of ca. 10 m^2 (20 m^3) was excavated. This included a 1 m x 3 m unit for confirmation of stratigraphic correlations and a 2.5 m x 3.0 m block excavation contiguous to the northernmost of the larger blocks excavated in 1983. Analysis is currently in progress. No diagnostic artifacts were recovered, although a relatively large sample of lithic and faunal remains was obtained. This will add substantially to the 1983 data for cultural components 6 through 9 of the Early Prehistoric record. Among the most interesting finds is that post holes and lithic distributions from the lowest cultural component suggest that a circular structure is represented. Several additional radiocarbon dates will be run on bone and/or charcoal from the Early Prehistoric occupation layers. This should aid in refinement of the chronological record.

The Beach Site (EhPv-72)

This prehistoric site was situated on a small bench interpreted as an aeolian capped beach associated with a large alluvial fan. The beach itself predates the human occupation of the locale and is correlated with the 1383 m level of Vermilion Lake at ca. 8000 to 10,000 B.P. (Fedje, White and Robinson n.d.; Kostaschuk 1980). In order to mitigate an accelerated development schedule proposed to impact the site in the early spring, test excavations were conducted in late winter (early February 1984). Two 2 m x 2 m units were excavated to about 1.5 m in depth (level of the basal beach deposits).

Prehistoric cultural material was recovered from approximately 5 cm to 30 cm below the modern soil surface. Preliminary data indicate that the sediments and constituent artifact assemblage were mixed through natural processes. Within this context, a limited lithic assemblage was recovered, including a quantity of debitage, a few tools and a single projectile point. No bone or intact features were observed. The projectile point recovered resembles most closely the Bitterroot type suggesting occupation during the Early Middle Prehistoric Period (Early Plains Archaic).

Paleoecological Research - Banff National Park (James White)

Paleoecological research is part of the Vermilion Lakes Archaeological Project. Sediment cores from two small lakes in the Bow Valley in Banff National Park have been obtained for pollen analysis and radiocarbon dating.

Grizzly Pond (informal name) is located at the junction of the Cascade and Bow valleys, on a terrace of Canmore Advance till (Rutter 1972). It is within the Montane Ecozone, and lodgepole pine is the dominant vegetation cover (Holland and Coen 1983). The pond is about 150 m in diameter and less than 2.5 m deep.

Two 5 cm diameter cores were obtained from the deepest portion of the pond, and are about 4.5 m long. They exhibit similar stratigraphy and sediment lithology. The upper 3.7 m of gyttja contain plant macrofossils and molluscs. Two tephras within the gyttja have been identified as Bridge River and Mazama by glass shard morphology (R. King written communication 1984). Below 3.7 m, the gyttja grades into clay with abundant molluscs, lenses of sand and fragments of the macrophytic alga Chara sp.

Copper Lake is on the floor of the Bow Valley near Castle Junction and Vermilion Pass, occupying an apparent kettle. Undifferentiated drift and morainal material surround and underlie the lake, and it is just within the limit of the Eisenhower Junction Advance (Rutter 1972). Copper Lake is within the Lower Subalpine Ecozone, and lodgepole pine is the present dominant vegetation cover. The transition between the Lower Subalpine and Montane Ecozones occurs within a few kilometres down-valley of Copper Lake (Holland and Coen 1983). Copper Lake is about 200 m in diameter, and apparently 8.6 m deep, at maximum.

Two 5 cm diameter cores of 8 m length were taken from the deepest part of the lake. Both cores have similar stratigraphy and sediment lithology. The upper 6 m of sediment is gyttja and contains three tephras. The upper tephra is probably Bridge River, the thick middle tephra is probably Mazama, and the lowest tephra is unknown. Below 6 m, the sediment is clay with sand lenses.

Radiocarbon dating and tephra analyses are being undertaken. Preliminary pollen analysis indicates that the clay-gyttja transition contains a sage-grass-pine pollen zone. Pollen analysis is continuing, and the diatoms are being analysed by Dr. M. Hickman.

Geochronological and Paleoecological Implications

The analyses to date permit only a preliminary statement of results and potential. Grizzly Pond contains a short post-glacial record, with a basal age estimated at 8000 B.P. This is broadly typical of sediment cores from the northwestern plains and foothills from ponds which dried up during the Hypsithermal warming period. The lower Bow Valley in Banff likely experienced similar climatic conditions. No further analyses are presently planned for Grizzly Pond.

Copper Lake contains a longer post-glacial record and will be the focus of further analysis. Upon completion of the radiocarbon dating and tephra identification, it should be possible to give a minimum age for deglaciation of the Bow Valley at Castle Junction, and to identify a pre-Mazama tephra. The chronology and nature of post-glacial revegetation will be clarified and supported by paleolimnology. The results will be related to the human occupation of the Bow Valley.

Archaeological Investigations at Rocky Mountain House (Lynda Gullason)

A four week excavation was conducted at Rocky Mountain House National Historic Park in July and August 1984. The field project was federally funded through the Environment 2000 programme. The objective of the project was to provide archaeological clearance prior to construction of interpretive trails in the vicinity of two known Hudson's Bay Company

Rocky Mountain House fort sites; one was occupied from 1835 to 1861 (15R), and the other was occupied from 1865 to 1875 (1R). Controlled shovel testing and hand excavation of sensitive areas was conducted along the trail system. Archaeological monitoring of construction activity also took place. In addition, excavation and assessment of a refuse area eroding out of the bank of the North Saskatchewan River, although not directly impacted by the trails, was also completed. This refuse area was associated with the Hudson's Bay Company Rocky Mountain House, 1835-1861.

Excavation units along the trail alignments were devoid of historic cultural features despite, in some cases, their proximity to palisade walls. A limited amount of historic period material, artifacts and faunal remains, was recovered in the vicinity of the 1835-61 site. Most of this material originated from the disturbed upper cultivation layer. The refuse area along the river was delineated, and large quantities of artifacts and faunal remains were recovered from undisturbed contexts.

Archaeological Investigations in Elk Island National Park (Shawn Haley)

Archaeological investigations in Elk Island National Park in 1984 were prompted by plans to develop and expand park facilities. In the fall, a two person field research team carried out site reconnaissance in five specific locales and mitigative excavations in two others. These field studies (Project WRA-84-68) followed compilation of a list of all known heritage resource sites within or immediately adjacent to the relevant development areas.

The locations of the five heritage resource impact assessments were: along the southwest half of Flyingshot Lake trail; along the proposed Astotin Lake west road; at the Buffalo Paddock Interpretive Tower site; at the Spruce Grove Interpretive Tower site; and along the western side of the Tawayik Narrows. Site reconnaissance at these locations included surficial inspection and both systematic and judgemental subsurface shovel testing. In the last area, prehistoric site FjPf-7 (521R) was also surveyed, recorded and mapped. The results of these HRIA surveys were as follows:

1. No heritage resource sites were identified in the areas of the Flyingshot Lake trail, the Astotin Lake road, the Buffalo Paddock Interpretive Tower site, and the Spruce Grove Interpretive Tower site.
2. At Tawayik Narrows, between Tawayik Lake and Little Tawayik Lake, development plans include building trails for cross-country skiing and hiking. Bridges may also be built across several natural drainage channels. Three prehistoric sites were inspected: FjPf-8 (521R; reported in 1977 - Wilson and Head 1978; see also Sumpter 1984); FjPf-6 (524R; reported in 1977 - Wilson and Head 1978); and FjPf-112 (523R). Following in-field reconnaissance, a Middle Prehistoric designation was tentatively assigned to the scantily represented occupation at site FjPf-112. Furthermore, it appears that there is reason to treat the entire narrows area as a single resource utilization area or site (Haley 1984:17).

At present, the Tawayik Narrows area is not immediately endangered by development plans which might adversely affect these sites. Recommendations have been made, however, that the area be periodically monitored.

Mitigative excavations at the East Road site, FjPe-2 (520R), followed discovery of cultural materials there earlier in the season (Sumpter 1984). Through excavation of a 2 m x 2 m pit at the site, some undiagnostic lithic materials and some poorly preserved faunal remains were recovered. This site probably represents the marginal remains of a larger campsite that may have been destroyed by initial construction of the east boundary road. Part of the site may remain undisturbed in the wooded area just outside the park and the proposed development area.

Due to proposed upgrading of the Astotin Lake picnic area and related hiking trails, mitigative excavations were conducted at the Beaver Bay site, FkPf-1 (522R), which had been identified earlier in the year (Sumpter 1984). Systematic excavation of 8 m^2 established that it is a campsite and is significantly larger than initially thought. Apart from historic materials probably associated with the picnic area, excavations revealed a single prehistoric component of as yet unknown temporal placement; the occupation probably occurred in the autumn. It is obvious that this site can provide a significant amount of information of prehistoric lifeways, particularly because it is relatively undisturbed.

Archaeological Investigations at the Echo Creek Site, Banff National Park (Sheila Robinson)

Part of the 1984 heritage resource impact assessment in Banff National Park involved determining how the widening of Norquay Road between the Echo Creek picnic area and the Vermilion Lakes Road would affect potential prehistoric or historic resources. Surficial inspection and subsurface testing in July identified a large prehistoric site situated on both sides of the road and extending approximately 100 m along a slight rise of fluvial/lacustrine deposits. The Echo Creek site, EhPv-78 (515R), appeared to contain one prehistoric component with well preserved faunal materials, as well as lithics tentatively associated with the early-middle Late Prehistoric Period. Because road widening, which would destroy much of what remained of the site, was scheduled to begin in the fall, plans were quickly implemented to conduct salvage archaeological investigations (Project WRA-84-69).

Initially, a four week field season involving a crew of five was planned to maximize recovery of information in the short time available. This was eventually extended to eight weeks (August 21 - October 12), with fewer excavators involved in the final weeks. Systematic subsurface testing of the site was to more precisely determine the horizontal and vertical distributions of cultural materials. Areal excavations were initiated in places where concentrations of lithic and faunal elements were uncovered through test excavations. Detailed records of site stratigraphy were made; samples of soils were collected, as were faunal remains, charcoal and tephras for dating purposes. For most of the site's matrices, 1/8" mesh screens were used, although heavy compaction in some instances necessitated a switch to 1/4" mesh. The larger mesh screens were also used in the final weeks of test excavation on southern portions of the site. Where dense concentrations of small lithic and faunal items were uncovered in one 12 m^2 area of the site (Operation 4), cultural strata were partially screened in the field with 1/8" mesh, and subsequently waterscreened with finer meshes. Although this technique did not allow complete recovery of lithic and faunal materials, it substantially increased the archaeological sample from this area. A total of 43 m^2 were excavated during the field season, using

17 1 m x 1 m test units and four block excavations. Shortly before the site was grubbed and excavated by heavy machinery, a series of trenches were excavated by backhoe along 60 m of the site's length to aid the identification of stratigraphic links among the block excavations.

The decision to extend the field season to eight weeks was prompted not only by delays in road construction activities but also by new discoveries made during test excavations. The first was that the site contained historic as well as prehistoric cultural materials. A preliminary search in the Archives of the Canadian Rockies located in Banff quickly associated these remains with the Brewster Dairy, established in the late 1880s to serve the needs of the local population and the C.P.R. for fresh dairy products. Because this dairy was one of the few commercial operations allowed in Banff National Park in the late nineteenth century and early twentieth century, and because the Brewsters are celebrated as one of Banff's pioneering families, Echo Creek site's historic component gained interesting significance. Information acquired later indicated that Jordan's Sawmill was once located on the site itself.

Initial test excavations made during the field season also demonstrated that at least two, if not three, distinct cultural components were present in the Echo Creek site's prehistoric assemblages. One of these components did indeed represent an early-middle Late Prehistoric occupation of the site (four projectile points tentatively identified as Besant were recovered in situ), but the recovery of more than 20 diagnostic projectile points from a later period indicated that a late Late Prehistoric occupation was also represented. The excavation of Operation 4, where this later component was found, revealed a complex assemblage of lithic and faunal materials which, by virtue of its intactness, affords a rare opportunity to study prehistoric cultural behavior of that time period in the Bow River valley. Other areas opened at the Echo Creek site during the field season revealed a complex stratigraphy containing buried soils, deposits of volcanic ash and quantities of bone and charcoal at various levels.

Although full analysis of the materials recovered from the Echo Creek site is pending, certain significant features of the prehistoric assemblages and their stratigraphic contexts can be noted, and are summarized below.

Approximately 26,000 faunal remains representing a variety of large mammals, small mammals, fish, birds and invertebrates were recovered from the Echo Creek site. Most are small fragments, but as much as 5% should be identifiable to species. Faunal analysis now in progress will help identify the types of habitats which were utilized by prehistoric site occupants, the time(s) of year the site was occupied, and various aspects of food processing. Preliminary assessment of the Echo Creek site's faunal assemblage suggests that a fairly broad spectrum strategy of subsistence related resource procurement had been developed by the region inhabitants in the Late Prehistoric Period, and possibly earlier. It can also be suggested that the site's inhabitants had economic arrangements which were sufficiently stable and well adjusted to local environmental conditions to allow extended, if not year-round occupation of the area.

Approximately 10,000 lithic items were recovered from the site. The variety of materials indicates that the prehistoric dwellers had access to several sources of rocks and minerals used in the production of tools. Some lithic resources may have been imported from places outside the modern Banff National Park area. Identification of these exotic sources will eventually furnish the basis for reconstructing patterns of prehistoric population movements and exchange. Associating some of Echo Creek's lithics with local quarry sites will also aid reconstruction of prehistoric schedules of resource exploitation in several of the Park's biophysical zones. The variety of lithic resources also suggests that the hunter-gatherers occupying the Echo Creek site focused on selecting those specific types of lithic materials with structural compositions particularly suitable for small tool manufacture. This preliminary interpretation is supported by indications that a sandstone-lined hearth located in the midst of a dense concentration of flakes, shatter and cores may have been used for heat-treating lithic materials to improve their flaking qualities. Analysis of the extensive range of lithic types recovered from the site will also provide substantial information about methods of lithic resource use.

Some portions of the upper components in the Echo Creek site showed clear signs of having been modified historically, but for the most part, stratigraphic layers remained intact. Recovery of information about the site's stratigraphy, including the collection of soil samples and the production of detailed drawings and photographic records, will aid in the reconstruction of some aspects of the site's paleoenvironmental history. At present, plans for analysing recovered stratigraphic materials are limited, although the dating of some carbon and tephra samples is in process. When the dates for certain deposits are known, it will be possible to more accurately estimate the ages of the site's various cultural components, and to determine a minimal basal date for a habitable Echo Creek site. The composite layers of silty sands in the top ca. 1.5 m of the site are most likely of fluvial origin, although aeolian deposits (of primary and secondary origin) may well be present. Below these fine textured layers are coarser sands and gravels, presumably once associated with the Vermilion Lakes. The presence of several paleosols buried within the site's horizons suggests a relatively active and irregular depositional history over the last few thousand years.

In view of the nature and concentrations of organic and inorganic materials found in association in several prehistoric cultural components of the Echo Creek site, it is obvious that the site area must have functioned as something more than a temporary hunting camp or an artifact manufacturing station at various times in the past. However, with the exception of two depressions tentatively identified as postholes, no significant prehistoric structural features were noted in the course of the field investigations. This absence of information undoubtedly reflects the limited time which was allotted for the field season and the related fact that such a small proportion of the site (less than 5%) was excavated.

Table 5. 1984 Alberta projects by the Archaeological Research Unit, Parks Canada, Western Region.

PROJECT NUMBER	RESEARCHER	PROJECT DESCRIPTION
WRA-84-2	Daryl Fedje	Mitigation - Vermilion Lakes Site (EhPv-8), Banff National Park
WRA-84-3	Ian Sumpter	HRIA - Lake Louise Trans-Canada Highway Interchange, Banff National Park
WRA-84-4	Ian Sumpter	HRIA (preliminary) - Natural Gas Pipeline Route Alternatives, Waterton Lakes National Park
WRA-84-5	Ian Sumpter	HRIA - East Park Gate Improvements, Banff National Park
WRA-84-6	Ian Sumpter	HRIA - Mount Norquay Ski Area Developments, Banff National Park
WRA-84-7	Ian Wilson	HRIA - Banff Townsite Peripheral Land Zone (contract), Banff National Park
WRA-84-8	Rod Pickard	Mitigation - Pocahontas, Jasper National Park
WRA-84-9	Rod Pickard	Mitigation - Jasper House, Jasper National Park
WRA-84-10	Rod Pickard	Mitigation - Patricia Lakes, Jasper National Park.
WRA-84-11	Ian Sumpter	HRIA - Lake Louise Townsite Developments, Banff National Park
WRA-84-12	Ian Sumpter	HRIA - Carrot Creek Information Centre, Banff National Park
WRA-84-13	Ian Sumpter	HRIA - Astotin Lake Day Use Area, Elk Island National Park
WRA-84-14	Ian Sumpter	HRIA - Tawayik Lake Road and Trail Improvements, Elk Island National Park
WRA-84-15	Ian Sumpter	HRIA - Beaver Bay Picnic Area, Elk Island National Park

Table 5 continued

PROJECT NUMBER	RESEARCHER	PROJECT DESCRIPTION
WRA-84-16	Don Hanna	Special Project - Lithics Processing/ Analysis (contract), Western Regional Office
WRA-84-17	Ian Sumpter	HRIA - North Gate Kiosk Development, Elk Island National Park
WRA-84-18	Ian Sumpter	HRIA-Administration Compound Access Road Construction, Elk Island National Park
WRA-84-19	Ian Sumpter	HRIA - Flyingshot Lake Trail Development, Elk Island National Park
WRA-84-20	Ian Sumpter	HRIA - Wood Bison Isolation Area Development, Elk Island National Park
WRA-84-21	Ian Sumpter	HRIA - West Boundary Road and Fence Project, Elk Island National Park
WRA-84-22	Ian Sumpter	HRIA - East Boundary Road and Fence Project, Elk Island Natonal Park
WRA-84-23	Ian Sumpter	HRIA - Moss Lake Picnic Area, Elk Island National Park
WRA-84-24	Kevin Montgomery	Special Project - Site Data Compilation Project (contract), Western Regional Office
WRA-84-27	Ian Sumpter	HRIA - Lower Pocahontas Access Road, Jasper National Park
WRA-84-28	Ian Sumpter	HRIA - Relocation and Evaluation of Prehitoric Site FfJm-6, Jasper National Park
WRA-84-29	Ian Sumpter	HRIA - Miette Hot Springs Development, Jasper National Park
WRA-84-30	Don Steer	HRIA (preliminary) - Bow Valley Parkway Extension, Banff National Park
WRA-84-31	Lynda Gullason	Mitigation - Shortwalk Trail Development, Rocky Mountain House National Historic Park

Table 5 continued

PROJECT NUMBER	RESEARCHER	PROJECT DESCRIPTION
WRA-84-34	Ian Sumpter	HRIA - Trans-Canada Highway Sunshine to Castle Junction, Banff National Park
WRA-84-35	Don Steer	HRIA - TransAlta Gauge Station Installation, Rocky Mountain House National Historic Park
WRA-84-36	Veronica Cadden	Special Project - Regional Reference Collection (contract), Western Regional Office
WRA-84-37	Anne Woollam	Special Project - Photo and Artifact Cataloguing (contract), Western Regional Office
WRA-84-38	Susan Langley	Special Project - Preliminary Underwater Reconnaissance - Project Habakkuk (Patricia Lake), Jasper National Park
WRA-84-39	Susan Langley	Special Project - Preliminary Underwater Reconnaissance - Minnewanka Settlements (Lake Minnewanka), Banff National Park
WRA-84-40	Susan Langley	Special Project - Preliminary Underwater Reconnaissance - The Gertrude (Emerald Bay), Waterton Lakes National Park
WRA-84-41	Dr. Roger King (U. of West. Ont.)	Special Project - Soil Analysis Miette Siding Archaeological Site (contract), Jasper National Park
WRA-84-42	Ian Sumpter	HRIA - Fireside Picnic Area, Trans-Canada Highway, Banff National Park
WRA-84-43	Ian Sumpter	HRIA - Norquay Road Widening, TCH to CPR Line, Banff National Park
WRA-84-44	Alberta Environmental Centre, Vegreville	Special Project - Vermilion Lakes Site C14 Dating Project, Western Regional Office

Table 5 continued

PROJECT NUMBER	RESEARCHER	PROJECT DESCRIPTION
WRA-84-45	Jack Porter	HRIA - Rock Cairns - Lake Louise Townsite, Banff National Park
WRA-84-50	Ian Sumpter	HRIA - Lake Louise Overflow Material Source Area, Banff National Park
WRA-84-52	Ian Sumpter	HRIA - Johnson Lake Terminus - Parking Expansion and Trail Upgrading, Banff National Park
WRA-84-53	Ian Sumpter	HRIA - Lake Minnewanka Primitive Campground Upgrading, Banff National Park
WRA-84-54	Ian Sumpter	HRIA - Fireside Trail Head/Proposed Edith Pass Trail Rerouting, Banff National Park
WRA-84-55	Ian Sumpter	HRIA - Healy Creek Borrow Area, Banff National Park
WRA-84-56	Ian Sumpter	HRIA - Km 14.9 TCH Animal Underpass, Banff National Park
WRA-84-57	Ian Sumpter	HRIA - Banff Hospital Site and Gopher Street Relocation, Banff National Park
WRA-84-58	Ian Sumpter	HRIA - Proposed Banff Cemetery Access Road, Banff National Park
WRA-84-59	Ian Sumpter	HRIA - Vermilion Lakes Drive Cul-de-Sac, Banff National Park
WRA-84-60	Ian Sumpter	HRIA - Highway Improvements, Waterton Lakes National Park
WRA-84-61	Ian Sumpter	HRIA - Staff Residence - Crandell Campground, Waterton Lakes National Park
WRA-84-62	Ian Sumpter	HRIA - Blakiston Creek Bridge (Temporary Replacement), Waterton Lakes National Park
WRA-84-68	Shawn Haley	Mitigation - 1984 Mitigative Archaeology, Elk Island National Park

Table 5 continued

PROJECT NUMBER	RESEARCHER	PROJECT DESCRIPTION
WRA-84-69	Sheila Robinson	Mitigation - Echo Creek Site Archaeology, Banff National Park
WRA-84-70	Brian Reeves	HRIA - Natural Gas Pipeline/Highway Improvements (contract), Waterton Lakes National Park
WRA-84-72	Ian Sumpter	HRIA - Johnson Lake Trail Improvements, Banff National Park
WRA-84-73	George Hennig	Special Project - 1984 Archaeology Projects Artifact Photography, Western Regional Office
WRA-84-74	Michael Wilson	Special Project - Vermilion Lakes Site Faunal Analysis (contract), Western Regional Office
WRA-84-75	Ian Sumpter	HRIA - Prince of Wales Oilspill Clean-up (site DgPl-78), Waterton Lakes National Park
WRA-84-76	Gwyn Langemann	Special Project - Jasper House Site Faunal Analysis (contract), Western Regional Office
WRA-84-77	Sharon Keen	Special Project - Artifact Study/ Faunal Analysis - Pocahontas (contract), Western Regional Office
WRA-84-78	Ian Sumpter	HRIA - Watt Residence Driveway Investigations (site DgPl-8), Waterton Lakes National Park
WRA-84-79	Dr. Erle Nelson (Simon Fraser U)	Special Project - Direct Detection Dating - Vermilion Lakes Site (agreement), Western Regional Office
WRA-84-80	Archaeological Research/Conservation Unit, WRO	Special Project - Soil Profile Transfers (conservation activity), Banff National Park
WRA-84-81	Helen Lemon	Special Project - Support Programme for 1984 Archaeological Projects (contract), Western Regional Office

Table 5 continued

PROJECT NUMBER	RESEARCHER	PROJECT DESCRIPTION
WRA-84-82	Dr. Roger King (U of West. Ont.)	Special Project - Tephra Analysis (contract), Western Regional Office
WRA-84-83	Brock University	Special Project - Echo Creek Site C14 Dating (contract), Western Regional Office
WRA-84-84	Thayer V. Head	Special Project - Echo Creek Site Faunal Analysis (contract), Western Regional Office
WRA-84-86	Richard Lalonde	Special Project - 1984 Archaeology Projects Drafting Support (contract), Western Regional Office
WRA-84-87	Beth Woolley	Special Project - 1984 Archaeology Projects Artifact Illustration (contract), Western Regional Office
WRA-84-89	Ian Sumpter	HRIA - Monitoring of Gas Pipeline Installation, Waterton Lakes National Park

PRELIMINARY RESULTS FROM THE 1984 FIELD SEASON AT HEAD-SMASHED-IN BUFFALO JUMP

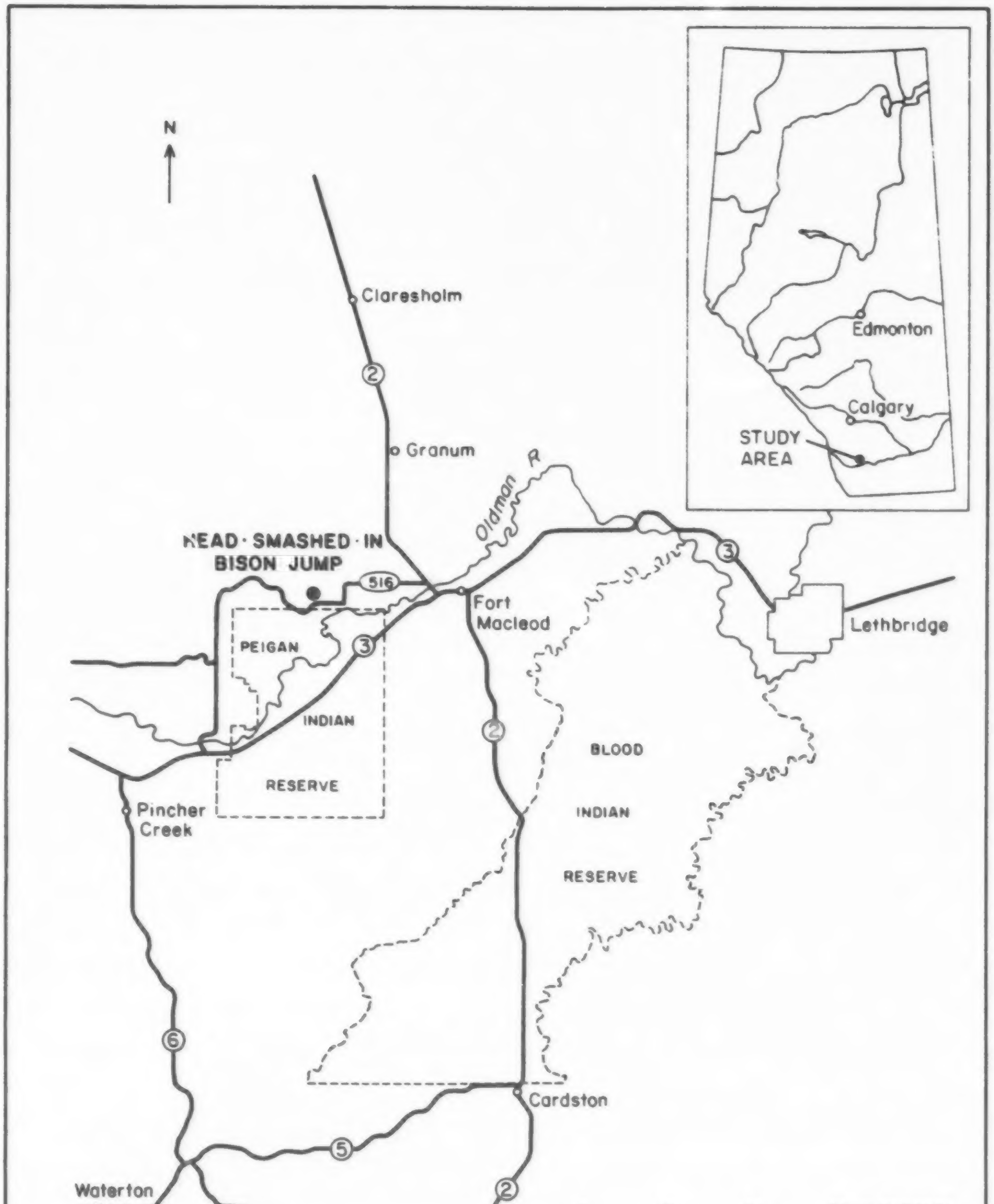
By
Milt Wright, Bob Dawe
Doug Glaum, Jack Brink
Archaeological Survey of Alberta

INTRODUCTION

During the summer months of 1984, a crew of eleven conducted the Archaeological Survey of Alberta's second season of fieldwork at the Head-Smashed-In Buffalo Jump site (DkPj-1) in southwestern Alberta. These studies are sponsored by Alberta Culture as part of the department's long range plan to develop a major interpretive program, complete with a visitor centre on site by 1987. In conjunction with this site development project, archaeological studies are required for two primary reasons: 1) to investigate and mitigate potential impacts to archaeological resources which may be occasioned by construction of interpretive facilities; and 2) to promote research oriented studies of poorly understood aspects of the site in relation to communal bison hunting in the northwestern Plains. The 1983 field season focused primarily on the first of these two objectives, and results of these investigations are presented elsewhere (Brink et al. 1984, 1985). As most mitigative work was completed in 1983, the 1984 field season emphasized the pursuit of specific research problems associated with site interpretation. This report will briefly present the major studies conducted and results achieved. A final report is in preparation.

1984 STUDIES AT HEAD-SMASHED-IN

Head-Smashed-In Buffalo Jump is situated in southwestern Alberta on the southeast edge of the Porcupine Hills, some 16 km west of Fort Macleod (Figure 10). The kill site lies beneath an 11 m sandstone bedrock drop. At the base of this drop, a series of rolling slump blocks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Claresholm
2
Granum
Oldman R
HEAD · SMASHED · IN
BISON JUMP
516
3
Fort Macleod
Lethbridge
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6
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Cardston
Waterton Park
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ALBERTA
MONTANA
Edmonton
Calgary
STUDY AREA

Figure 10. Location of the study area.

terrace down to a gently sloping prairie where the remains of butchering and processing are found (Figure 11). Bison were brought to the kill site from a large, naturally confined, collecting basin which encompasses an area of some 40 km^2 to the west of the cliff. Movement of animals to the site was aided by the use of an extensive series of drive lane stone cairns, which line the ridges and swales of the collecting area. These lanes may extend as much as 15 km from the kill site. Other features located nearby and believed to be associated with the kill-butchering site include a series of petroglyphs and a vision quest site.

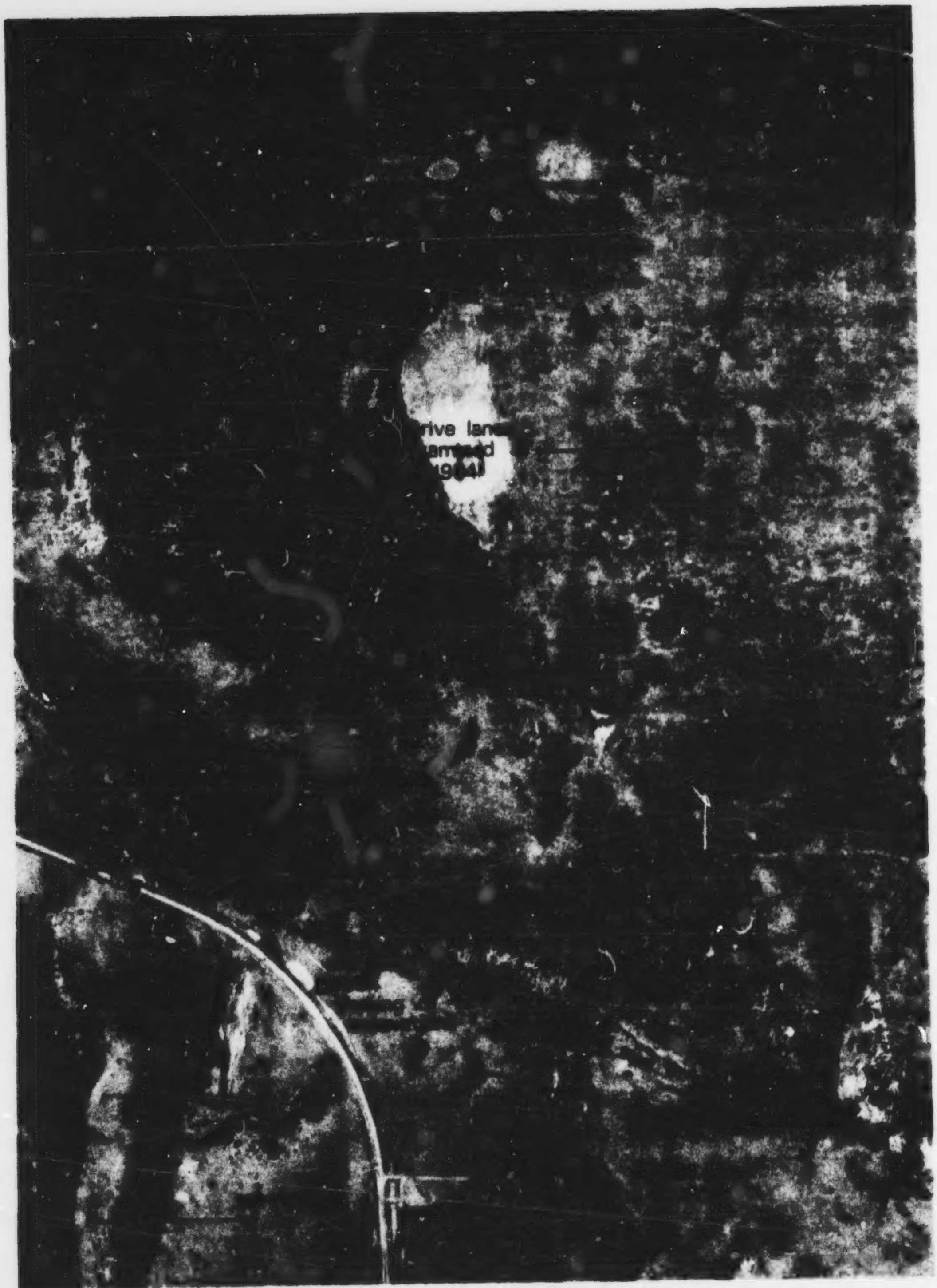
Previous studies conducted at the site have been discussed elsewhere (Brink et al. 1984) and will not be repeated here. The above referenced report also contains a series of recommendations for future research, and these formed the basis of the 1984 field season. Studies conducted in 1984 are as follows:

1. A block excavation of a portion of the butchering/processing site on the prairie level below the cliff.
2. Mapping and recording of the petroglyphs situated on a sandstone knoll west of the kill.
3. A preliminary study of the drive lane complex.
4. Mapping and recording of the vision quest site on a hilltop to the north of the kill.
5. A series of experiments with feature construction and use.
6. Initiation of long term taphonomic experiments.
7. A lithological survey of the site area identifying surface and near surface rock materials.
8. Continued mitigative studies relating to site development.

This report will focus on some of the on-going analyses and summarize some of the more important results.

PRELIMINARY RESULTS

One of the objectives of the 1984 field season at Head-Smashed-In was to investigate the presence of spatial patterning in the bone, stone and feature distributions in the camp and processing site. The previous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1984

Figure 11. Aerial photography of Head-Smashed-In area showing kill and processing areas, and 1984 study areas.

year's research had established the basic structural characteristics of the camp and processing site (i.e., absolute size, depth of deposit), but we had only the barest indications of the organization of activities within the site. It seemed predictable that the activities conducted in the camp and processing site should be the continuum of tasks that started at the kill site. We would predict that most of the activity on the prairie flats below the kill site involved secondary butchering, preservation and consumption of meat, processing bone for the extraction of marrow and grease, as well as a myriad of tasks that would be expected to occur in a prehistoric camp. Some, or perhaps all, of these tasks should be manifest in the distributions of bone, lithics and features, but earlier excavation units had been too small and widely dispersed to permit meaningful spatial analyses.

It was also evident that some areas of the processing site hold greater promise for the discovery of activity patterning. These were the peripheral areas that surround the core of the processing site. We concluded from our 1983 field excavations that the core area (see Figure 11) is significantly more disturbed than outlying areas because of successive occupations, and that little contextual information could be extracted from these deposits. Thus, we determined that the location of the 1984 excavation units should be peripheral to the core area; the 1983 surface survey results were used to guide the selection of a specific area. Ultimately, an area several hundred metres north of the core processing area and north of the spring channel was selected (Figures 12 and 13). Several partially exposed rock features, including hearths and a possible tipi ring, were noted in the area. In total, 16 contiguous excavation units comprising a 56 m^2 (7 m x 8 m) block excavation were completed. All cultural materials except sub-surface pits were recovered in the upper 20 cm of soil.

The data which were forthcoming from the block excavation were more than equal to our expectations, yielding abundant faunal remains, hearths and pit features, concentrations of fire broken rock and lithic debris, as well as ceramics, worked bone, shell and historic glass beads. Although the deposits within the block excavation are deflated and made up of several collapsed components, the degree of mixing and post depositional disturbance appears much reduced compared with previous

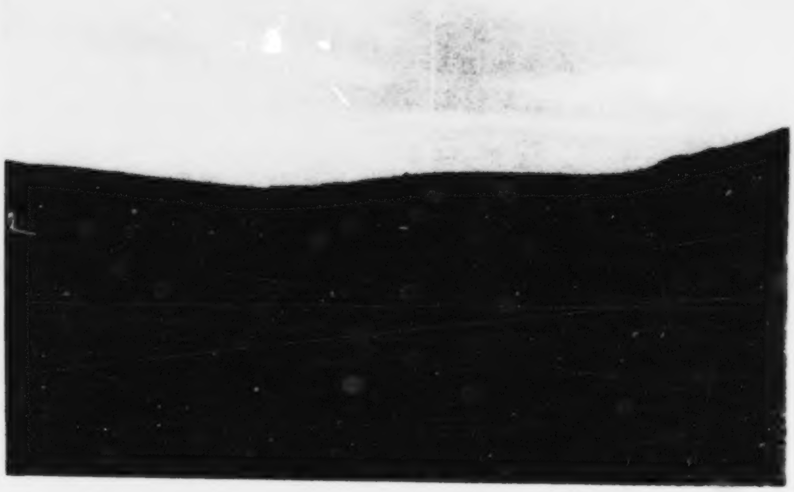

Figure 12. View of block excavation looking south toward the core area of the camp/processing site.

Figure 13. View of block excavation looking southwest with jump site in the background.

units excavated in the core area. For example, the preservation of bone was noticeably better and included some articulated elements and identifiable bone butchering units (see Figure 19). Features were well represented and included hearths, pits, bone uprights, bone pegs and fire broken rock concentrations. More importantly, the distribution of the various classes of remains appeared to hold some promise for the analysis of artifact patterning and delineation of specific processing activities (Simek 1984). These, in turn, might be related to the partial ring structure within the block excavation, providing an initial impression of community level patterning at Head-Smashed-In. In the discussion which follows, each of the item classes noted above is discussed separately, and an overview of some of the questions which we hope to address is presented.

FAUNA

The 1984 field season at Head-Smashed-In represents the second season of excavations in the processing area. The bulk of the faunal assemblage was removed from the 56 m^2 block excavation on the northern periphery of the main processing area. The remainder of our sample came from excavations resulting from mitigation procedures in a proposed parking lot situated approximately 900 m to the south of the block excavation.

The assemblage was catalogued using a customized numerical coding system which recorded provenience, taxonomic and anatomical information, cultural modifications, approximate age, weights and fragment counts. All cataloguing, descriptive and analytic statistics were accomplished with the aid of the University of Alberta's mainframe computer system. The SPIRES data base management system, MIDAS and SPSSX statistical packages were employed.

The faunal assemblage of approximately 5475 identified elements was dominated by bison remains (89.5%), but also included wolf (0.1%), dog (1.0%), coyote (0.2%), mule deer (0.1%), beaver (0.1%), and burrowing rodent (0.1%). Tens of thousands of tiny bone scraps could only be identified as "large mammal", probably rib and long bone fragments. These are believed to be either the result of natural weathering of bones left exposed at the site, or of intentional cultural modification for boiling and grease extraction, or both (Dawe et al. 1984). In 1983, all such tiny fragments were retained; however, subsequent analysis suggested this was unwarranted and, therefore, only a sample of this material was collected in 1984.

The faunal remains from the block excavation at the processing area were recovered primarily from the upper 15 cm of loessial soil, intermingled with a dense blanket of fire broken rock, flaked stone, and numerous features. By and large, the fauna was evenly scattered over the 56 m^2 area, but a few localized concentrations and articulated units were noted. This situation changed dramatically as the general occupation surface--from 0 to 10 cm in depth--was cleared away, exposing dense concentrations of faunal material at feature locations. Often, except in the case of the richest features, the widespread nature and high frequency of bone at the processing area prevented the identification of features until after the upper, compressed occupation level had been removed.

In contrast, excavations in the proposed parking lot area, situated quite peripheral to the main kill and processing area (see Figure 11), revealed relatively deep and stratified deposits with much improved faunal preservation. These excavations are placed quite close to a steep rise up to the bedrock escarpment, and in a small runoff gully where colluvium collects, thus accounting for the presence of stratified remains in this area. Approximately 2000 bones were recovered from 16 m^2 of excavations; many of these are large, well preserved elements suggestive of primary kill rather than secondary butchering and processing. This is especially true of a thick band of semi-articulated bones buried at a depth of 50 to 90 cm in the small gully.

Analysis of the 1984 faunal material will pursue several avenues of investigation. First, element frequency (both NISP and MNI) is being used to examine the proportion of skeletal parts believed to be representative of killing vs. butchering/processing activities as found at the processing site. It is expected that these data will help formulate a structural framework for the sequence of killing, initial butchering and transport of skeletal parts to the lower prairie level for final processing. Second, major processing activities with high archaeological visibility are those of bone marrow extraction and the degreasing of major grease bearing bones. Analysis of the faunal data is focusing on identification of an order or pattern to element utilization for these purposes. In this respect, the indices of grease and marrow formulated by Binford (1978) are being compared to the Head-Smashed-In data. Early results suggest a remarkable fit between Binford's model and the Head-Smashed-In data, although this must be tempered by consideration of taphonomic factors which could simulate patterns closely paralleling the proposed cultural activities. With this latter caveat in mind, we have initiated experimental studies at Head-Smashed-In to help document the effects of taphonomic processes on exposed bison bones. Furthermore, since Binford's indices were formulated using sheep and caribou data, we have initiated a chemical study of marrow and grease in bison bones to check the applicability of Binford's indices at a bison kill site. The third avenue which the faunal analysis is pursuing is examining the sex ratio of the recovered faunal material, using sex determination on front and rear limb bones. It is hoped that if a large enough sample of elements can be sexed, the results may indicate a preferential selection based on sex of animals from the kill site for subsequent processing. This long term study will require sexing of kill site material also. Preliminary results indicate a 2:1 preference for females at the processing site.

Finally, the spatial organization of the faunal data is being examined. As mentioned, some of the bone elements reveal modifications consistent with bone processing for marrow and grease extraction. These data will be plotted to determine whether they occur throughout the excavation unit or in specific areas, perhaps in association with pit features. The objective here is to attempt to segregate boiling pits that may have been used for grease rendering from other kinds of features such as roasting pits. These, in turn, will be compared to other feature distributions to determine, for example, how these activities may have been arranged relative to the ring structure and hearth areas. Other artifact distributions will also be compared to the faunal plots, including fire broken rock and lithic debris, for it is likely that bone boiling for grease extraction would be associated with masses of fire broken rock and some kind of hammer/anvil stone tool kit (Vehik 1977).

LITHICS

This year's lithic analysis will focus on the characteristics of the manufacturing and maintenance of lithic tools at Head-Smashed-In as well as the distribution of lithic debitage. We anticipate that some areas within the processing area may have been used habitually for the manufacture or maintenance of lithic tools, while other areas, perhaps in association with features, may have been the scenes of tool use (Stevenson 1984).

Excavations during the 1984 field season at Head-Smashed-In produced a lithic inventory of about 18,000 items, mostly fine grained debitage, but including almost 300 cores and more than 700 tools; approximately 200 of the latter are projectile points. More than 95% of these lithics were recovered from the block excavation in Area 2 where, except for a few isolated pit features, the deposits appeared mixed or compressed. Better stratigraphy was exhibited in Area 12, where approximately 200 items were found, including some from what may be a discrete Pelican Lake component.

Despite the differences in the location of the excavations and the excavation strategy, the nature and size of this assemblage remarkably duplicates the results of the 1983 excavations (Brink et al. 1984, 1985). Again, most of the projectile points recovered are small, side notched Late Prehistoric types similar to those of the Old Women's Phase (Forbis 1960, 1977) and the Plains and Prairie side notched points described by Kehoe (1966, 1973). It is becoming clear, however, that as the sample of projectile point types increases, there is a proportional increase in the range of peculiar morphological configurations which fail to be accounted for by the conventional idealized constructs. Avonlea points are similarly well represented, and the first example of a Head-Smashed-In Avonlea variant (cf. Reeves 1983a:Figure 15) found during this project was recovered this year (Figure 14o). Projectile points in the size range of dart points are represented by fragments only, excepting an aberrant stemmed argillite specimen (Figure 14v). These dart size specimens include a few fine examples of Pelican Lake points (Figure 14t,u), and a few specimens likely representing Besant and possibly Hanna points. Also of interest was the recovery of a basal fragment of what appears to be a McKean lanceolate point (Figure 14w),

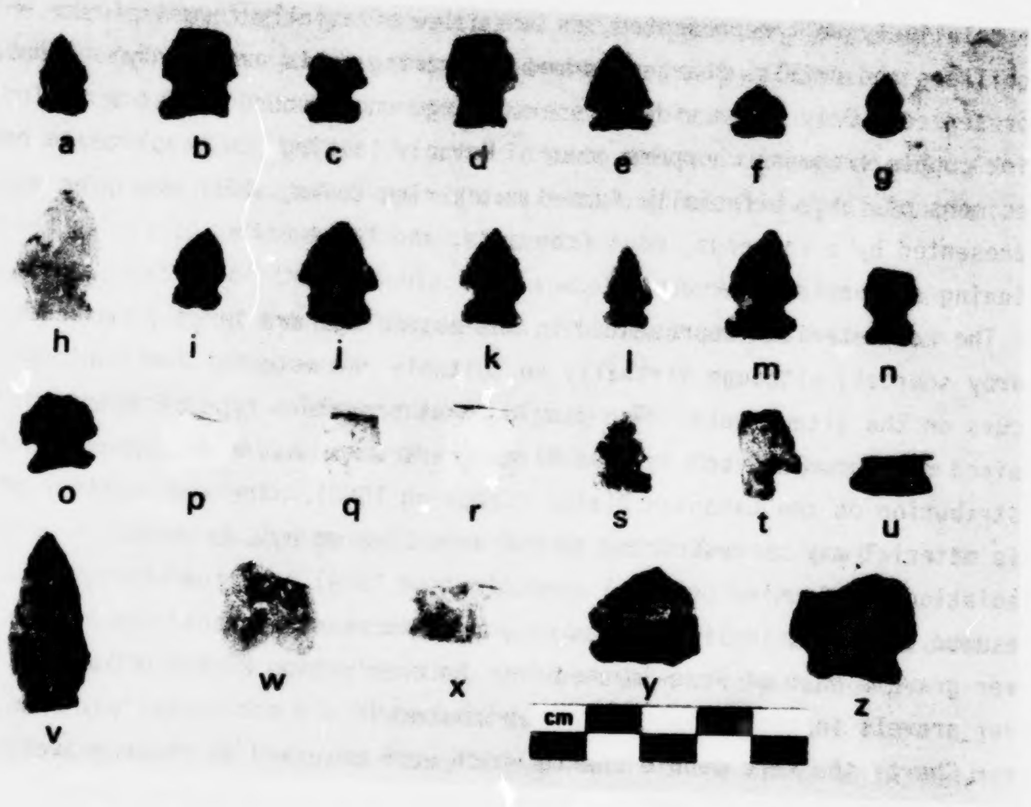
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Figure 14. A sample of projectile points recovered during 1984 excavations at Head-Smashed-In.

found in a pit feature dated to 2710 ± 150 years B.P. (AECV #60C). Previously, McKean Complex points had only been recovered from the surface at Head-Smashed-In (Reeves 1978:172).

Preliminary examination of the remainder of the assemblage tends to reinforce the impressions gleaned from the 1983 analysis. The assemblage is characterized by a large number of small pieces of fine grained debitage and fewer pieces of coarse grained debitage, numerous bipolar pebble cores, and a tool assemblage dominated by small notched projectile points and small marginally retouched or utilized flakes. End scrapers are relatively well represented, as are a few bifacially formed pièces esquillées and drills. Larger formed butchering tools are poorly represented. Only a few side scrapers, large edge ground flakes and thick cobble fragment choppers occur. Notably lacking are complete specimens of large bifacially formed butchering tools, which are only represented by a few ends, edge fragments, and large biface thinning/sharpening flakes.

The raw materials represented in the assemblage are largely from nearby sources, although virtually no suitable raw material for flaking occurs on the site itself. The single, most prevalent type of fine grained raw material used is Swan River Chert which has a widespread distribution on the Canadian Plains (Campling 1980). The availability of this material may be restricted to the area covered by Laurentide glaciation (J. Brumley personal communication 1984) and, therefore, is presumed available in till exposures and in increasing quantities in river gravels east of Head-Smashed-In. An examination of the Oldman River gravels in the vicinity of Head-Smashed-In did not reveal any Swan River Chert; the rare pebble cherts which were observed in those gravels were of highly variable quality, mostly poor, and characterized by uncontrollable blocky fracture.

In the lithic assemblage at Head-Smashed-In, Swan River Chert is represented in all the major tool categories, by all stages of lithic reduction and is the most prevalent material type in the bipolar cores. Also well represented are exotic fine grained raw materials including Madison Formation cherts from Montana, Knife River Flint, Yellowstone obsidian, Kootenai argillite, and fine grained materials from various sources in the Canadian Rockies and foothills, but their occurrence in the lithic inventory is almost exclusively in the small formed tool categories and the small thin resharpening and refinishing debitage. The popularity of the fine grained materials is expressed in the small nature of tools and debitage made of these materials which appear to be used, reused, and reduced to the point of exhaustion. The bipolar technique appears to be the favoured means by which the reduction of small pieces was accomplished, not only of pebbles, but also in the reduction of broken pieces of tools and small thick flakes.

The most common coarse grained material is the green argillaceous sandstone, available as pebbles and cobbles in the nearby Oldman and, in particular, the Belly River drainage. The larger pieces of coarse grained materials which litter the site in part reflect the better supply of these materials, but even these show maximum utilization with multiple use modes as anvils, choppers, or boiling stones.

In consideration of the assemblage as a whole, there seem to be two major aspects in which the Head-Smashed-In assemblage varies from other communal bison kill sites:

1. there appears to be a larger number of cores and a better representation of all stages of lithic reduction at Head-Smashed-In than other sites; and,
2. there is a virtual absence of large formed butchering tools at Head-Smashed-In.

This latter feature of the assemblage is particularly problematic, as our review of the literature indicates that these tools are comparatively common at other communal kill sites (cf. Newton 1983), and Reeves has noted the occurrence of numerous heavy stone tools in the campsite midden at Head-Smashed-In (1978, 1983b). Why these artifacts have eluded us is not clear. Given the lack of raw material suitable for the manufacture of these implements on the site proper, it may be that they were in fact curated and carried away from the site, or perhaps used and discarded in the kill deposits.

Reher and Frison (1980) have postulated a model whereby hunters would prepare for a major communal kill by "gearing up" at quarry sites, often quite distant from the kill sites, and preparing blanks for tools which would later be used and reduced sparingly at the kills. This model would account for a lack of finished tools at a kill site and would also explain a lack of evidence of primary reduction. At Head-Smashed-In, however, there is ample evidence that such a portable tool kit was augmented with expedient tools made of locally available materials. The frugality of the Head-Smashed-In hunters, expressed in the maximization of utilization of lithic resources, seems consistent with the curation of finished tools. If the curation of butchering tools implied by Reher and Frison at the Vore site (1980) was similar to that practised at Head-Smashed-In, then it should be possible to detect the presence of these tools with a close scrutiny of the debitage. Such an analysis of the debitage from the butchering area at Piney Creek by Frison (1967) detected the presence of several types of processing tools even though the tools themselves were absent.

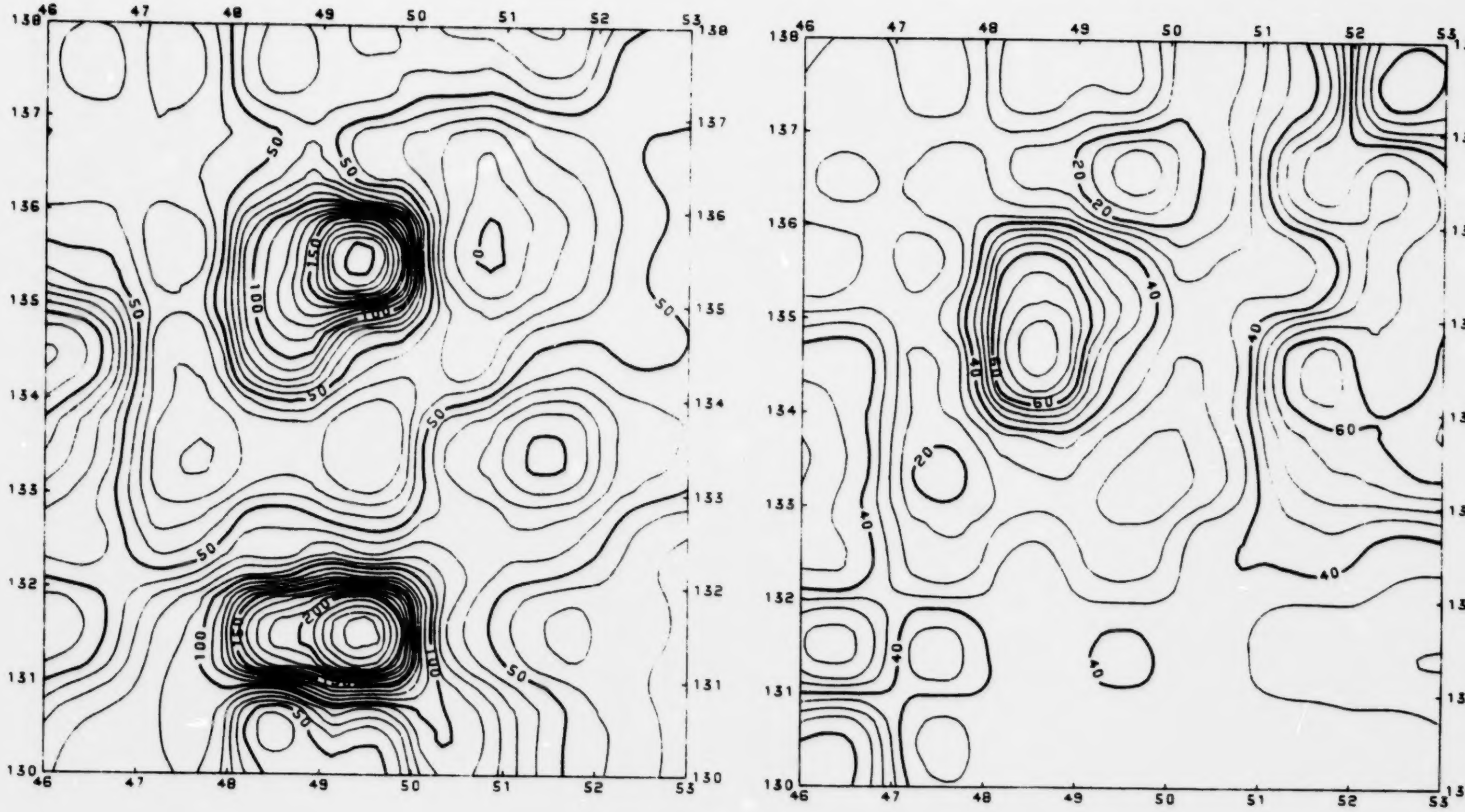
The analysis of lithic material recovered during the 1984 field season at Head-Smashed-In is aimed at quantifying what constitutes an assemblage which is presumed to represent a narrow range of activities associated with the processing of bison. To evaluate the assemblage in this light, a detailed analysis of the debitage will be undertaken to supplement the information derived from the tool inventory.

FIRE BROKEN ROCK

The analysis of fire broken rock has been completed, and some interesting aspects of this study are presented here. A total of 6611 fragments of fire broken rock weighing in excess of 400 kg were recovered from the block excavation. All fragments larger than a few centimetres in maximum dimension were drawn in situ, collected, material typed, and measured according to maximum length and weight. Initial inspections of the fire broken rock point provenience maps failed to reveal any obvious patterning and, by and large, the fire broken rock seemed to be ubiquitous within the block excavations. There were, however, a number of well preserved pit features amid the blanket deposit of fire broken rock fragments, and we suspected that some relationship might exist between the pits and the distribution of fire broken rock.

To discover such patterning requires the simplification of the mapped data, and a computer graphics program was employed which uses average counts and weights per 1 m^2 unit. Examples of the contour plots that result are illustrated in Figure 15. In addition, the study used three dimensional plots called perspective block diagrams, or fishnet plots (Sampson 1978) to assist in the examination of patterning (Figure 16). The size classes of fire broken rock ranged from 0-5 cm to greater than 20 cm maximum dimension, in 5 cm increments. The analysis revealed that less that 2% of the assemblage was larger than 10 cm and that the majority of fire broken rock was less than or equal to 5 cm in maximum dimension. The two contour plots in Figure 15 reveal two concentrations of fire broken rock in the 0-5 cm class. The concentrations in both the northern and southern halves of the unit are coincident with pit features. However, when comparing the plot of the 5-10 cm size class in Figure 15, it is clear that the southern concentration no longer exists and the northern concentration has changed location. These changes are clearly displayed in Figure 16, where the peaks in the fishnet are representative of the concentrations seen in the contour maps. Without presenting a detailed discussion, it is suggested that the southern concentration of small fragments is a discard zone of exhausted fire broken rock, whereas the northern concentration is representative of larger pieces of rock that were still reusable. The details to support this proposition are presented in the final report (Brink et al. 1985).

It suffices to state here that, despite the evidence for multiple occupations of the block excavation area, a contextual integrity to the fire broken rock distributions appears to remain. When these are compared to the feature distributions, it may be possible to isolate specific processing events such as meat roasting, marrow extraction and bone boiling. For example, a pit feature was located adjacent to the northern concentration of reusable fire broken rock and was also in association with a concentration of broken bison bone. The bone was located on the north side of the pit while the stone was concentrated on the south. Several nearby hearths could have provided the means for heating the stone which may have then been transferred to the pit for boiling bone to obtain grease. In order to more accurately determine the residues of such activities, the 1984 field programme also included an experimental component which is discussed below. These kinds of studies assist in the explanation of activities associated with the different


46
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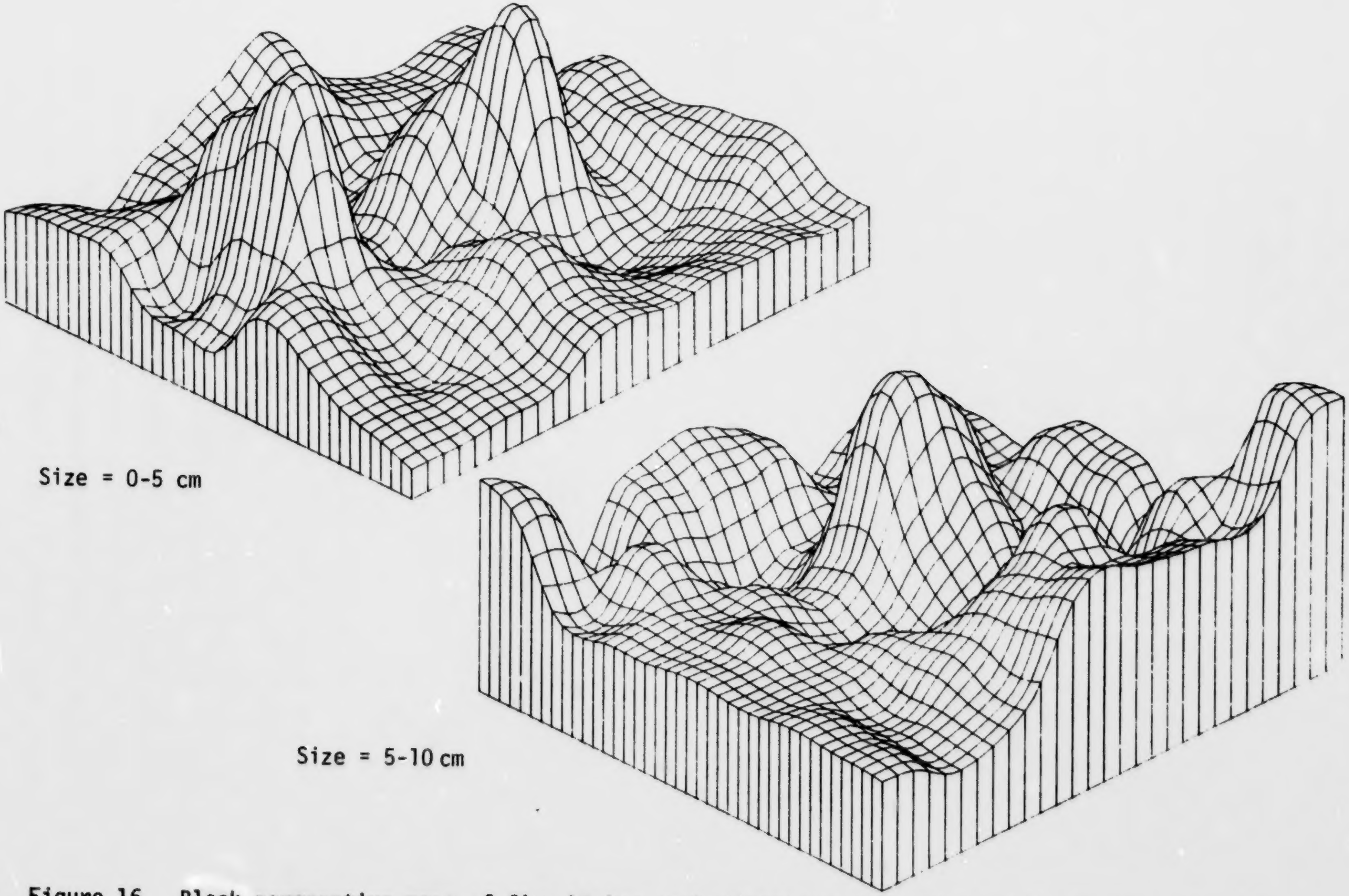
52
53
130
131
132
133
134
135
136
137
138
0
50
100
150
200
20
40
60

Contour Interval = 10 items
N = 4013 Size = 0-5 cm

Contour interval = 5 items
N = 2522 Size = 5=10 cm

Figure 15. Contour maps of fire broken rock distribution based on size class.



Size = 0-5 cm

Size = 5-10 cm

Figure 16. Block perspective maps of fire broken rock distribution based on size classes. (Lowest corner projection represents the southwest corner of excavation unit in Figure 15).

kinds of features and associated residues of artifacts, fire broken rock and faunal remains.

FEATURES

A large number of well preserved features were recorded within the block excavation, including pits, hearths, bone uprights, bone pegs, fire broken rock concentrations and a variety of bone concentrations which exhibit evidence of specific butchering practices (Figures 17 to 20). The radiocarbon assays obtained so far indicate that many of the features were constructed and abandoned during the Late Prehistoric Period, but one date of 2710 ± 150 B.P. from a pit feature (Figure 17) clearly indicates the multicomponent makeup of the deposit. Detailed analysis of the feature matrices has not been completed but these, along with the distributional data, may assist in identifying and delineating the activities that predominated at the camp and processing site. Moreover, the arrangement of the various types of features relative to other remains will assist in interpreting how the activities of the camp were organized.

EXPERIMENTAL STUDIES

Finally, a variety of experimental programs was initiated during the 1984 field season involving boiling stone technology and bison bone taphonomy. The objective of the boiling stone experiments was to determine why the local supplies of sandstone were largely avoided and the effort made to import quartzites from distances of 1 to 2 km. Ancillary to this main objective was the evaluation of a variety of fuel types, including bison dung, and the assessment of different types of features for the purposes of heating stone and for boiling water. The results of the study suggest that factors of thermal inefficiency and grit residue tend to curtail the use of sandstone as a boiling stone. Experiments with different varieties of hearth and pit features will have to continue in order to provide useful analogues for the interpretation of the Head-Smashed-In camp and processing site features. Unlike some previous studies, the results of these experiments indicate that bison

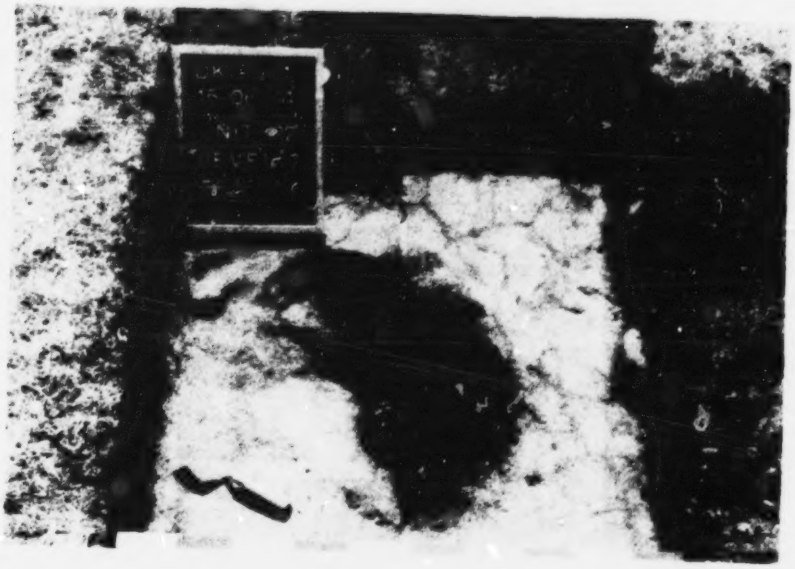


Figure 17. Pit feature in block excavation.

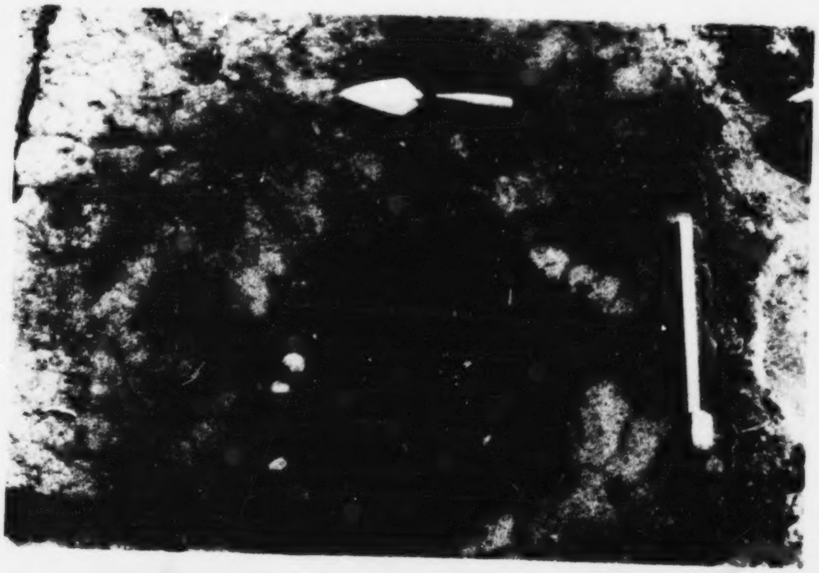


Figure 18. Hearth feature in block excavation.

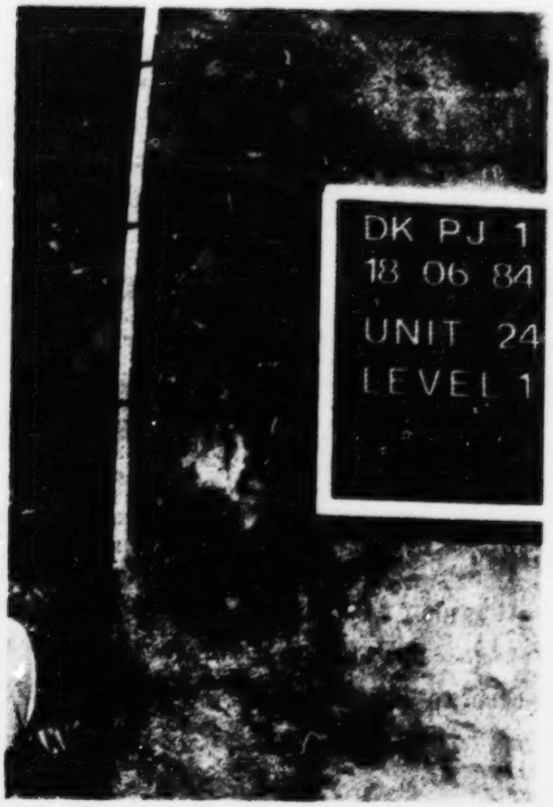

DK PJ 1
18 06 84
UNIT 24
LEVEL 1

Figure 19. Bone butchering unit.

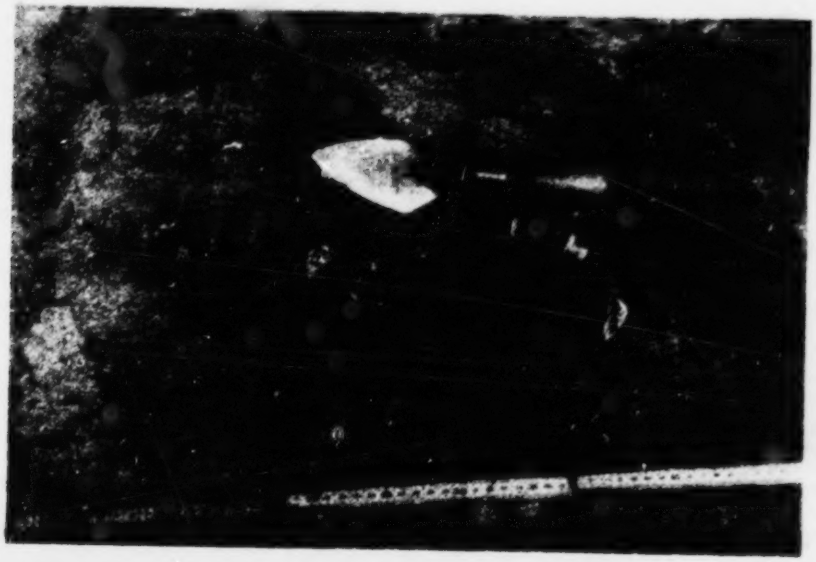


Figure 20. Bone upright feature in block excavation.

dung is an excellent fuel under certain atmospheric conditions, although the fuel is best suited to only a few heating tasks.

The bison bone taphonomy experiment is a long term project designed to evaluate the weathering stages of bone when exposed in a prairie setting. A variety of elements were exposed on the prairie flats north of the block excavation. These will be observed on a semi-annual basis to determine rates of deterioration. The results of this multi-year study will help to determine the differential destruction of bison bone that can be expected to occur on Plains archaeological sites, especially those similar to Head-Smashed-In where soil deposition is extremely slow and bone exposure is extreme.

CONTINUING STUDIES

Many of the projects initiated in 1984 will continue into the 1985 field season. These include continued experimentation with feature construction and use, more taphonomic studies of bison bone, continued excavation of the processing area, and much more research on the drive lane system. Monitoring and mitigative studies of the interpretive facilities will also continue in 1985.

Some new studies will also be conducted. Most important of these will be a test excavation of the springhead area near the kill site where we anticipate recovery of perishable materials in the saturated deposits. Additionally, we hope to conduct some local site surveys to attempt to locate possible winter camps where hunters who used the jump may have retreated after fall kills. Such camps are believed to be located on low floodplains of the Oldman River but have yet to be discovered.

CHEMICAL AND MINERALOGICAL COMPARISON OF PREHISTORIC POTTERY AND RAW CLAYS FROM BLACK FOX ISLAND, LAC LA BICHE

By

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INTRODUCTION

An archaeological investigation was conducted on Black Fox Island, Lac La Biche in July through August 1982 (Learn 1983). Pottery assigned to the Late Prehistoric Period was excavated at sites GfPa-32 and GfPa-41. Most of Pot A at GfPa-32 was excavated from an eroding bluff face. Pot B at GfPa-41 was excavated from a test pit. The occurrence of diagnostic pottery is unusual for the northeast-central Alberta Boreal Forest region. For this reason, the pottery was selected for intensive analysis when analysing the artifact component. Besides the conventional visual analysis, chemical and mineralogical analyses were performed. These analyses were required to determine whether pottery manufacture was a local or site associated activity, or whether it was more likely that pottery was imported for use at the site. The working hypothesis was that the pottery of Black Fox Island was made of clay from a source on the island.

The presence of a clay deposit on the east shore of the island, approximately 100 m from site GfPa-32 and about 5 m from site GfPa-41, was pointed out by a local informant (T. Maccagno personal communication 1982). Before proceeding with the chemical and mineralogical studies, the clay was tested for suitability in pottery manufacture. Two experiments with pottery making showed that the clay could easily be modelled into the shape of a vessel and fired in an open fire. It was then decided to proceed with the quantitative and qualitative analyses.

THE SAMPLES

Pottery samples from two separate vessels were analysed. Site GfPa-32 yielded a fairly large quantity of pottery, 386 sherds, of a size range from ca. 5.0 mm to 60.0 mm. This sample represents the remains of one vessel. The rim, including some of the neck and shoulder, has been reconstructed (Figure 21). The vessel is of medium size (rim diameter approximately 17 cm), and brownish in colour. It has a fabric-impressed exterior and smoothed interior, punctated neck, and angular shoulders. The sherds are relatively thick (average 10 mm), tend to split laminarly, and contain occasional large grit/temper inclusions. The other sample of pottery, from site GfPa-41, differs in appearance from the GfPa-32 sample. Only three body sherds comprise this sample. The wall thickness is ca. 7.0 mm, the sherd exterior colour has an orange cast, and the impressions differ from those of the GfPa-32 vessel, being either cord-marked or truncated fabric-impressed. For further description of the Black Fox Island pottery, see Learn (1982:6-14, 33).

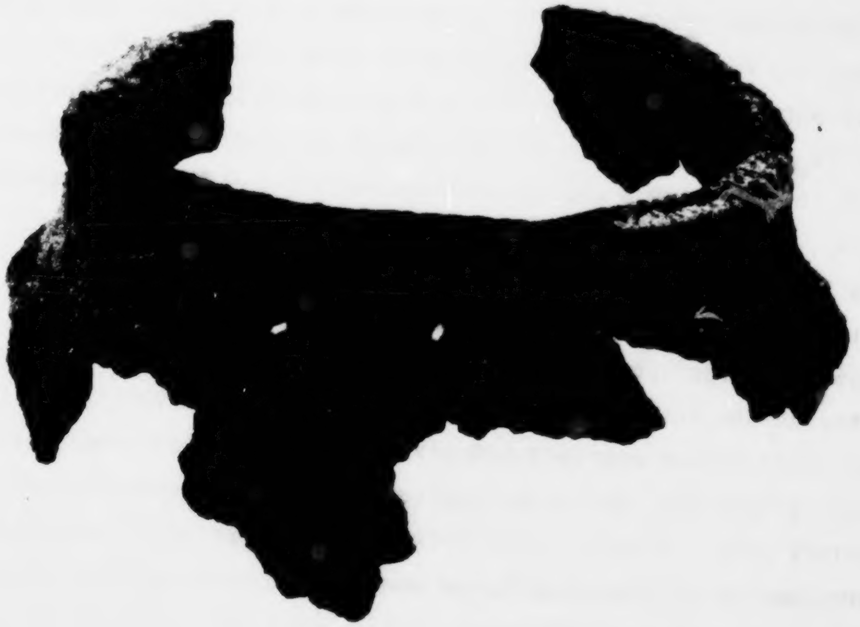

Figure 21. Reconstructed rim from Pot A, GfPa-32.

Raw clay was obtained from three locations on the east shore of Black Fox Island. These deposits included the one found with the help of the local informant and two others found through survey of the east shore. No other suitable clay sources were noted in the course of an archaeological reconnaissance of the island. The clay samples were formed into tiles and fired in a small electric kiln at a temperature calculated not to exceed the maximum known for open hearth, low temperature firing, ca. 900 to 950°C (see Rye 1981:25, 98; Shepard 1961:83). A sample (Clay 4) of a clay-like soil was gathered from a feature on site GfPa-32.

THE ANALYSES

As stated earlier in this paper, the hypothesis was that the Black Fox Island pottery was make of clay found on the island. The approach to testing the hypothesis was to compare the chemical and mineralogical composition of the pottery to the composition of raw clays found on Black Fox Island. Instrumental neutron activation analysis (INAA) was used to characterize the elemental composition of clay and pottery samples. Selected major and trace elements in the samples were identified and quantified. In mineralogical analysis, thin-sections of pottery and fired clay were examined under a petrographic microscope to identify and characterize mineral inclusions. Mineralogical study has its primary importance in identifying and describing the non-clay mineral inclusions in the clay, including cultural inclusions (temper) and naturally occurring inclusions.

Chemical analysis (using techniques other than INAA) and mineralogical analysis have been used together in previous studies of pottery technology in Manitoba and Saskatchewan (Hanna 1982, 1983). Generally, this tandem approach has given optimal results because the two techniques corroborate each other and can provide supplementary and complementary data. Mineral identification and description can be used to compare samples of sherds with one another and also to gain information about pottery technology.

INSTRUMENTAL NEUTRON ACTIVATION ANALYSIS

PROCEDURE

In the INAA process, a sample with stable isotopes is irradiated by neutron bombardment, forming unstable or radioisotopes. When these radioisotopes decay, they emit gamma rays which can be measured by the spectrometer, and the elements can be identified by the energy of the gamma peaks (Duke 1983:5). An example of a gamma spectrum from one irradiated sample is presented in Figure 22. For the Black Fox Island analyses, the facilities of the SLOWPOKE Reactor at the University of Alberta campus were used. The INAA analyses were preformed by M.J.M. Duke of the SLOWPOKE Facility.

The pottery and the tiles were individually prepared for irradiation by first crushing each sample, and then encapsulating each in a polyethylene vial. Mineral inclusions greater than 0.07 cm were sieved out of the pottery, to approximate as closely as possible the clay of manufacture before temper was added. Initially, a short term irradiation and counting procedure was conducted, to arrive at preliminary results. A second, longer irradiation and counting process was conducted for the same samples. In addition, more samples of the pottery and clays were analysed to obtain a larger population for greater statistical accuracy. It was at this point that Clay 4 was analysed.

STATISTICAL METHODS

The statistical analysis of the results was conducted by using the Michigan Interactive Data Analysis System (MIDAS) available on the University of Alberta mainframe computer. Analysis of variance and Student's t-test are two statistical tests which are particularly suited to drawing inferences from small sample populations (for sample population sizes, see Table 7).

Two-sample t-tests were used for comparison between two different samples, for example, Pot A and Clay 1 (refer to Table 8). The objective was to determine quantitative similarities or differences of eleven selected elements (Sm, Eu, U, Th, Ta, Sc, Co, Sb, Fe, Na, As - see Table 8)

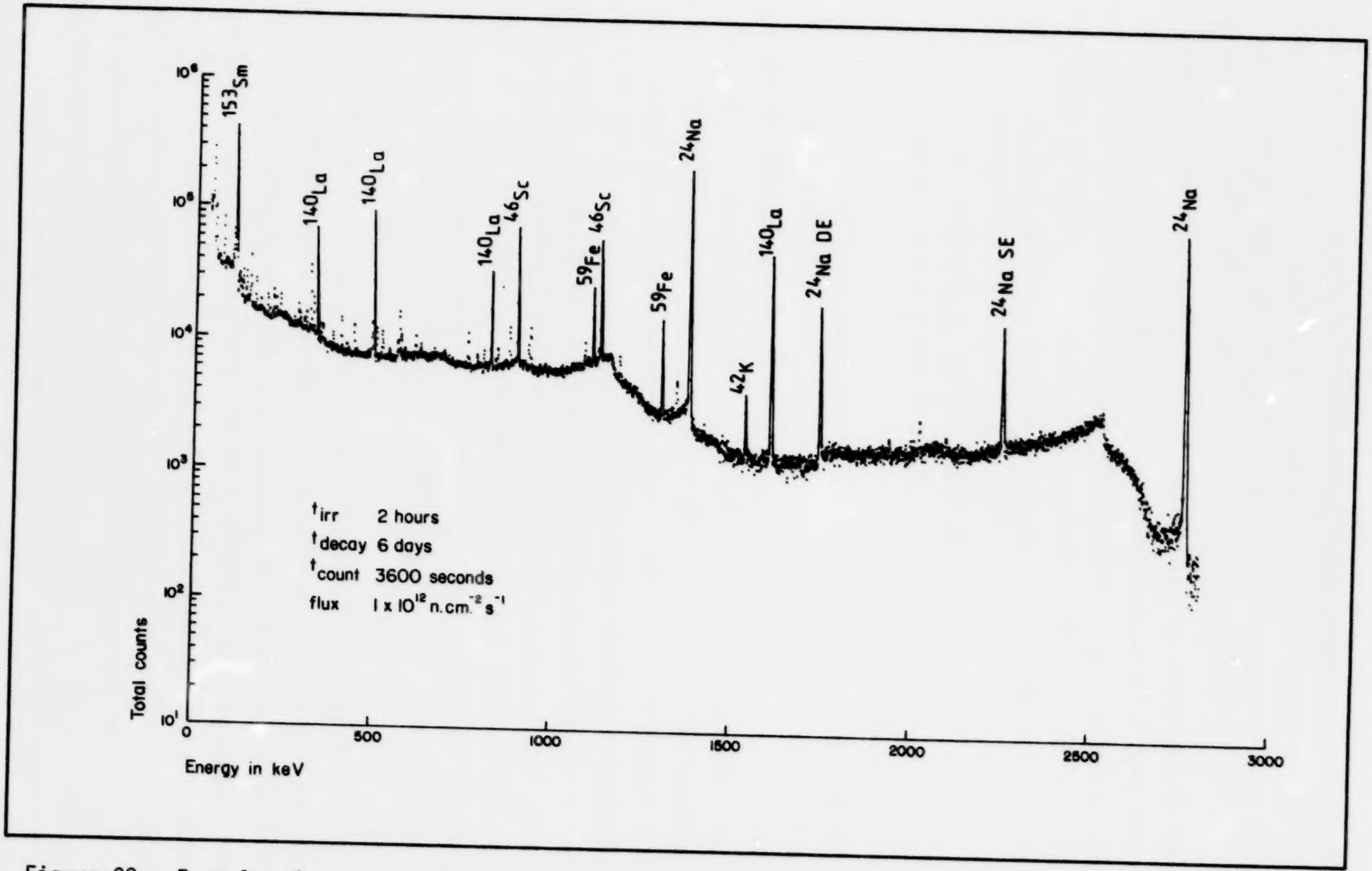

Figure 22. Example of a gamma spectrum from one irradiated sample.

Table 7. Net results of statistical analysis of pottery and clay relationships.

Sample (n=sample size)	differs from (H1)	similar to (H0)	indeterminate (P)
Pot A n=12	Clays 1,2,3,4, Pot B	NIL	NIL
Pot B n=6	Clays 1,2,3, Pot A	NIL	Clay 4
Clay 1 n=3	Clays 2,3,4, Pot A, Pot B	NIL	NIL
Clay 2 n=3	Clays 1,3,4, Pot A, Pot B	Clay 4	NIL
Clay 3 n=3	Clays 1,2,4, Pot A, Pot B	NIL	NIL
Clay 4 n=6	Clays 1,3 Pot A	Clay 2	Pot B

within each sample. First, results of the analysis of variance (F-test) were examined. Where the F-test significance was greater than 0.10, it indicated with a 90% confidence level that the variances were equal.

The Student t-test significance was evaluated to see if the means were equal. If the Student t-test significance was less than 0.010, the null hypothesis (H0) would be rejected and the hypothesis (H1) would be validated, suggesting that the two samples were different. For purposes of the statistical analyses of the INAA results, the hypothesis (H1) was that the pottery was different from the clay. The null hypothesis (H0) was that the two samples compared were indistinguishable from one another. In some cases, the F-test significance or the Student t-test significance rendered the case ineligible (pass or P).

Table 8. Examples of statistical comparisons between samples.

Element* n=11	Pot A n=12 $\bar{X}$	Pot A n=12 S^2(var)	Clay 1 n=3 $\bar{X}$	Clay 1 n=3 S^2(var)	F-Test statistic/significance	Student t-Test statistic/significance	Hypothesis accepted
Sm	4.32	0.115	6.38	0.132-1	8.71/.1075	-10.10/.0000	H1
Eu	0.79	0.939-2	1.32	0.360-2	2.61/.3096	-8.86/.0000	H1
U	1.57	0.112	3.37	0.457-1	2.44/.3261	-8.76/.0000	H1
Th	10.48	1.189	9.72	0.113	10.50/.0901	1.17/.2648	P
Ta	0.96	0.947-2	1.08	0.373-2	2.54/.3167	-2.09/.0569	H0
Sc	11.23	0.984-1	18.50	0.490	4.98/.0289	-28.30/.0000	P
Co	11.13	0.800	17.83	1.213	1.52/.2619	-11.80/.0000	H1
Sb	0.64	0.320-1	1.31	0.493-2	6.49/.1410	-6.22/.0000	H1
Fe	3.38	0.118-1	4.71	0.123-2	9.54/.0986	-20.56/.0000	P
Na	0.88	0.705-3	0.56	0.863-4	8.17/.1140	20.27/.0000	H1
As	5.01	1.783	15.70	0.130	13.72/.0699	-13.40/.0000	P

Total: H1 = 6, H0 = 1, P = 4

Conclusion: The hypothesis is accepted, i.e., Pot A can be differentiated from Clay 1.

Table 8 (continued)

Element* n=11	Pot B n=6		Clay 4 n=6		F-Test statistic/significance	Student t-Test statistic/significance	Hypothesis accepted
	$\overline{X}$	S^2(var)	$\overline{X}$	S^2(var)			
Sm	5.87	0.163	5.29	0.235	1.45/.3480	2.23/.0497	HO
Eu	1.09	0.327-2	0.92	0.530-1	16.23/.0041	1.82/.0992	P
U	2.33	0.190	2.30	0.317-1	6.01/.0356	0.12/.9058	P
Th	9.88	0.545	8.98	1.058	1.94/.2422	1.73/.1146	HO
Ta	0.80	0.135-1	1.13	0.241-1	1.78/.2705	-4.21/.0018	H1
Sc	10.47	0.187-1	10.31	0.923	49.44/.0003	0.39/.7038	P
Co	9.76	0.202	9.38	1.446	7.14/.0250	0.72/.4869	P
Sb	1.45	0.502-1	0.85	0.660-1	1.32/.3852	4.29/.0016	H1
Fe	2.94	0.796-2	3.23	0.382-1	4.80/.0550	-3.34/.0074	P
Na	1.00	0.240-2	0.55	0.290-3	8.27/.0184	21.45/.0000	P
As	11.92	1.210	11.57	5.479	4.53/.0615	0.33/.7483	P

Total: H1 = 2, HO = 2, P = 7

Conclusion: The results are indeterminate for the Pot B and Clay 4 relationship.

Table 8 (continued)

Element* n=11	Clay 4 n=6		Clay 2 n=3		F-Test statistic/significance	Student t-Test statistic/significance	Hypothesis accepted
	$\overline{X}$	S^2(var)	$\overline{X}$	S^2(var)			
Sm	5.29	0.235	6.94	0.400-1	5.88/.1517	-5.51/.0009	H1
Eu	0.92	0.530-1	1.24	0.343-2	15.44/.0620	-2.36/.0506	P
U	2.30	0.317-1	2.54	0.182-1	1.74/.4045	-2.05/.0796	HO
Th	8.98	1.058	10.42	0.457	2.32/.3285	-2.16/.0673	HO
Ta	1.13	0.241-1	1.10	0.225-1	1.07/.5460	-.276/.7906	HO
Sc	10.31	0.923	11.40	0.210	4.40/.1957	-1.82/.1124	HO
Co	9.38	1.446	-12.80	0.210	6.88/.1317	-4.63/.0024	H1
Sb	0.85	0.660-1	0.85	0.973-2	6.78/.1334	-.263-15/1.000	HO
Fe	3.23	0.382-1	3.60	0.226-1	1.69/.4122	-2.85/.0248	HO
Na	0.55	0.290-3	0.67	0.252-3	1.15/.5254	-10.47/.0000	H1
As	11.57	5.479	11.17	1.263	4.34/.1979	.275/.7914	HO

Total: H1 = 3, HO = 7, P = 1
Conclusion: The null hypothesis is accepted, i.e., Clay 4 is not differentiated from Clay 2.

* Sm - Samarium
Eu - Europium
U - Uranium
Th - Thorium
Ta - Tantalum
Sc - Scandium
Co - Cobalt
Sb - Antimony
Fe - Iron
Na - Sodium
As - Arsenic

RESULTS OF INAA

The results determined from the short term irradiation and counting indicated that:

1. the four pottery samples from the GfPa-32 vessel (Pot A) did give uniform readings, that is, they clustered together;
2. the clay samples from each of the three locations (Clays 1,2,3) were different from one another, yet more similar to each other than they were individually to the pottery;
3. the pottery vessel from site GfPa-41 (Pot B) differed in chemical composition from the GfPa-32 vessel; and,
4. the pottery seemed to be of a different chemical composition than the clay.

These relationships are demonstrated in Figure 23, an example of a scatterplot representation comparing the variation of two elements (Sb and As) measured in all the clay and pottery samples.

The short term irradiation results (stated above) were largely substantiated (Learn and Duke 1984) following the long term irradiation and counting. In addition, more specific information was added to the results. A comparison between Pot B and Clay 4 did not result in confirmation or rejection of the hypothesis (see Table 8). Table 8 shows the relationship between Clay 4 and Clay 2, which results in the null hypothesis being accepted, i.e., that Clay 4 may not be distinguished from Clay 2.

In summary, the chemical analysis does not indicate a correspondence between the clays and the pottery samples. There is an indeterminate relationship between Pot B, from GfPa-41, and Clay 4, which was derived from a feature at GfPa-32. There is a correspondence between Clay 2 and Clay 4.

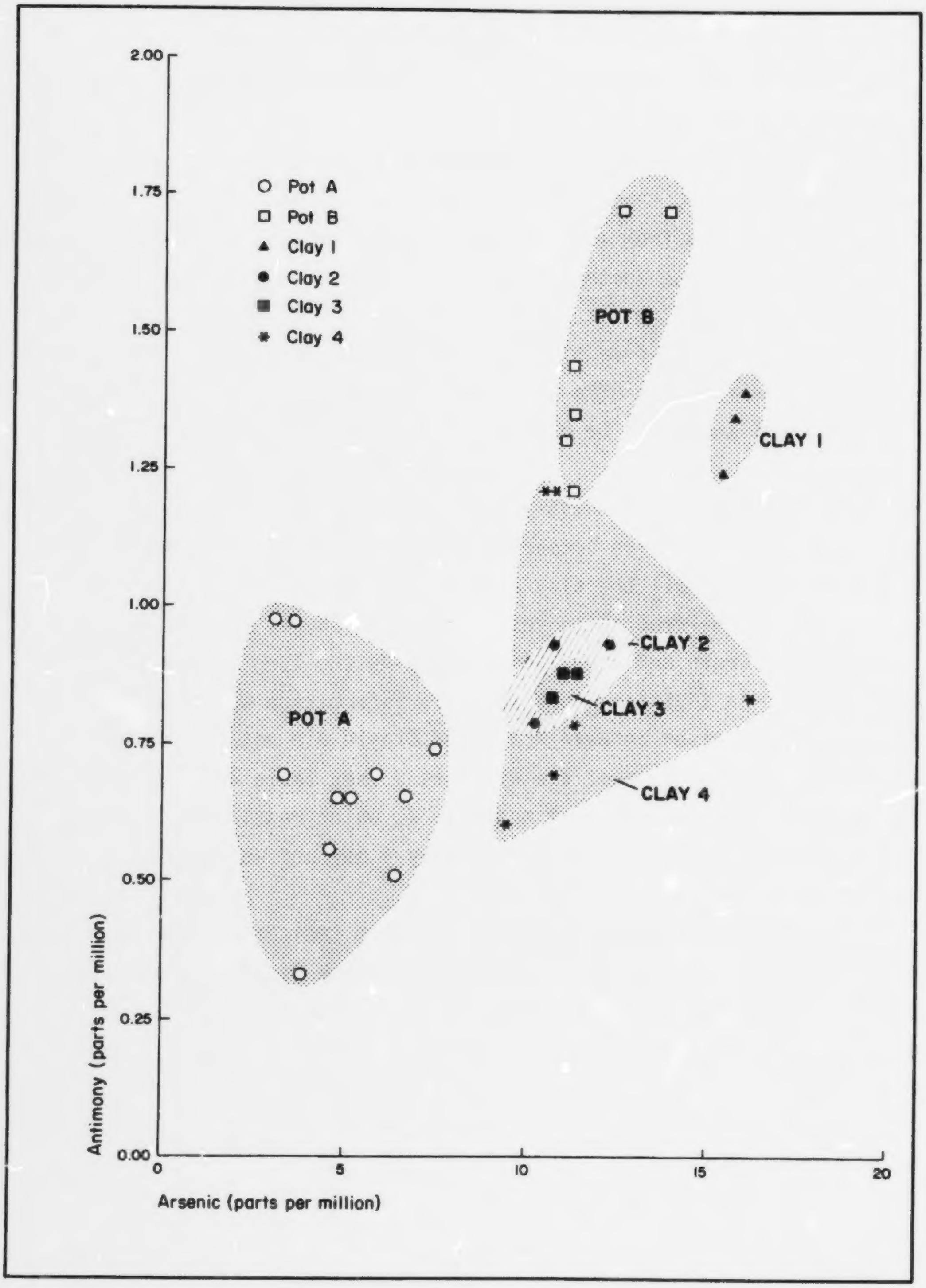

Figure 23. Example of a scatterplot representation comparing two elements.

MINERALOGICAL ANALYSIS

PROCEDURE

Thin-sections of the two pottery vessels and of the tiles representing the three island source clay samples were made; it was not felt necessary to thin-section Clay 4. These thin-sections, mounted on glass slides, were examined under a petrographic microscope. The mineral components of the pottery and clay samples were identified and described by D. Schnurrenberger, Department of Geology, University of Alberta. The objective of the analysis was to obtain specific information about the non-plastic inclusions, or mineral components. In the pottery, these inclusions comprise both naturally added and culturally added (temper) minerals.

THE MINERAL IDENTIFICATIONS

Five thin-sections of pottery from site GfPa-32 were examined. Table 9 lists the mineral identifications for Pot A, GfPa-32. Mineral fragments greater than 1.0 mm in size were present, but not prevalent. These were igneous rock fragments containing quartz and plagioclase. These particles can also be easily seen in a megascopic examination of the GfPa-32 pottery vessel sherds. Four sherds had rounded or subrounded quartz particles in the 1.0 - 0.5 mm size range. Feldspar also appeared in this size range, both rounded and angular in shape. Chert was observed in the size range 0.49 to 0.20 mm, but not in all samples. Rounded and angular quartz and feldspar also appeared in this range. Both rounded and subangular quartz and some feldspar occurred in the 0.19 mm to 0.10 mm range, with rare chert and amphibole. Lastly, in the silt size (less than 0.10 mm) category, several minerals were identified as occasional occurrences, including chlorite, amphibole and muscovite. Predominating in this size range were angular quartz and feldspar.

One pottery thin-section was examined for the vessel from site GfPa-41. It had mineral content similar to the GfPa-32 pottery samples. Table 9 displays the mineral identifications for Pot B, GfPa-41.

Table 9. Mineral identifications of clay and pottery samples.

Sample Number	SIZE RANGES OF MINERALS >1.0 mm	<1.0 - 0.5 mm	<0.5 - 0.2 mm	<0.2 - 0.1 mm	<0.1 mm	Comments
32-911 Pot A	NIL	An unknown quantity of subrounded to rounded quartz; a few subrounded to rounded feldspar.	2 rounded sedimentary rock, possible chert; 1 angular orthoclase fragment.	Abundant rounded quartz; a few subangular feldspar fragments.	1 chlorite, 1 rounded amphibole, 1 plagioclase; a few subrounded and subangular quartz and feldspar.	Rare biotite laths present.
32-910 Pot A	NIL	NIL	A few subrounded to subangular quartz fragments.	A few subrounded quartz and feldspar; 1 chlorite frag.; some chert; 1 subrounded amphibole.	Unknown quantity of angular and subangular quartz and feldspar, 1 muscovite.	N/C
32-935 Pot A	1 large frag. biotite plus a heavily altered plagioclase and quartz fragment.	Abundant and subrounded quartz; abundant angular feldspar.	NIL	NIL	A large quantity of predominantly angular and some subrounded quartz; 1 small chert.	N/C
32-89 Pot A	2 plagioclase and quartz grains.	2 large rounded quartz fragments; 1 angular plagioclase fragment.	Rounded subangular quartz; some feldspar; 1 possible quartzite fragment; 1 piece of chert.	Relatively angular, plus a few rounded, quartz and feldspar fragments; 2 pieces of biotite with amphibole attached.		N/C
32-912 Pot A	NIL	1 angular microcline and quartz grain; Several subrounded quartz, 1 rounded plagioclase.	Subangular quart and feldspar.		Frequent predominantly angular subrounded quartz and feldspar.	N/C
41-3 Pot B	Angular granitic rock fragments.	1 rounded quartz.	Occasional angular feldspar.	Small black possible organic or clay "chunks"; plagioclase; rounded chert.	Angular, subrounded probable quartz and feldspar.	N/C
3 C Clay 3	NIL	NIL	Rare very altered feldspar.	Minerals too small for identification.		N/C
2 B Clay 2	NIL	NIL	NIL	Very abundant 1 mm quartz with feldspar.	NIL	This clay appears very different from the other clays; similar to pottery matrices.
1 C Clay 1	Feldspar fragments altered to clay.	Rare rounded quartz.	NIL	NIL	Predominantly angular and subangular quartz and feldspar (a few subrounded); muscovite.	N/C

The three clay samples were fairly similar to one another, and differed, as a group, from the two pottery samples (Table 9). Two of the clay samples (2,3) had no minerals over 0.2 mm in size. The minerals identified under 0.2 mm in size were predominantly quartz and feldspar. Clay 1 had the greatest variety of identifiable minerals for the clays, since muscovite was also detected along with the quartz and feldspar.

DISCUSSION OF MINERAL IDENTIFICATIONS

While there was some mineralogical variability between the samples, such as would be expected of sherds representing different sections of any vessel, the similarities indicate a consistency such as could be expected for any single vessel. The results of the mineralogical analysis indicate that the two pottery samples, Pot A from GfPa-32 and Pot B from GfPa-41, both contain granitic rock, as indicated by the angular fragments of feldspar, quartz and joined feldspar/quartz fragments. The angular fragments are most likely cultural inclusions, representing rock crushed specially for the purpose of tempering the clay (Rye 1981:37). Angular quartz and feldspar inclusions appear in all size ranges for the two pottery vessels, although in different quantities per range. Minerals other than quartz and feldspar are rare, with some occurrences of chert, chlorite, muscovite and amphibole. These latter four minerals are also found in granitic rock.

The clays are mostly unlike the pottery in size, quantity and kinds of mineral inclusions. This is expected since pottery manufacture requires the addition of temper resulting in larger and different mineral inclusions in the pottery than in the clay. However, all the clay samples have quartz and feldspar as their smallest inclusions, just as the pottery samples do.

According to Schnurrenberger (personal communication 1984), the Clay 2 matrix has an especially similar appearance to the pottery matrices. This observation means that, generally speaking, the clay could have been used to manufacture the pottery. A more intensive mineralogical description of these smaller quartz and feldspar inclusions might confirm or reject this possible association. Unfortunately, there are no exotic or rare mineral inclusions which would serve to distinguish the samples to either ally them or distance them from one another; quartz and feldspar are fairly common in both clay deposits and pottery.

SUMMARY OF ANALYSES

It appears that the elemental composition of the pottery sample from site GfPa-32 does not correlate with the elemental composition of any of the raw clays sampled. The mineralogical analysis indicates that granitic rock temper was most likely used in the pottery. The comparison of the two pottery samples indicates a general technological similarity (i.e., addition of crushed granitic rock), although the two vessels appear different with respect to specific inclusions. The mineralogical examination indicates that the island clay, particularly that from one source (Clay 2) could have been used to manufacture the pottery, based on similarities of the clay's mineral inclusions and the pottery's smallest inclusions. However, this possibility is not confirmed by the chemical analysis.

CONCLUSION

The research hypothesis that the pottery of site GfPa-32 was made of clay from specific local sources (Clays 1, 2 or 3) was not proven true. In order to prove the hypothesis, a direct correspondence of pottery with clay would have to be achieved. No such correspondence was achieved. Therefore, together with a number of additional lines of evidence, the results of the study suggest that the pottery of GfPa-32 was not made of local clay.

There may be other clay sources in the general Lac La Biche area from which the vessels were made. There may be other clay sources on the island that were not discovered through inquiry or during a survey of the island. However, the clay sources sampled are suitable for pottery manufacture and they are near the sites. They are thus likely candidates for use in prehistoric pottery manufacture, if "the principle of least effort" is invoked to infer that known deposits nearest the site of manufacture will be used (Rye 1981:12).

A second line of evidence to indicate that the pottery was probably imported is the fact that the remains of only one vessel were found on site GfPa-32, although the site was extensively sampled. If manufacture of vessels occurred on the island, more than one vessel would likely have been found. Like the "principal of least effort" for resource exploitation, the lack of more than one vessel at GfPa-32 is only an indication that the pottery was not made locally, not proof. Admittedly, the lack of other vessels could be due to an excavation strategy which missed other vessels, or it could be due to erosion, if other vessels were lost down the bluff slope of GfPa-32. There is also a wide range of cultural factors which could have contributed to the recovery of only one vessel at GfPa-32.

A third line of evidence is that the stylistic and structural attributes of the GfPa-32 sample indicate a connection with Southern Alberta Late Variant Saskatchewan Basin ware as defined by Byrne (1973). It is therefore possible that the vessel was transported from southern Alberta.

There was no definite correlation between the GfPa-41 sample (Pot B) and the clay samples. The GfPa-41 sample is not complete enough to identify it stylistically, although in exterior surface pattern, colouring and wall thickness, it differs from the GfPa-32 sample.

To conclude, chemical and mineralogical analyses should be viewed as necessary supplements to more conventional visual examinations of pottery. They allow a more intimate look at the ceramics technology, and permit a more objective comparative data base to be formed.

ACKNOWLEDGEMENTS

The author acknowledges the services of the SLOWPOKE Reactor Facility and the technical help given by Mr. M.J.M. Duke of the Facility. An NSERC SLOWPOKE infrastructure grant supported the activation analysis. Thanks to those who read and commented on this paper.

THE BURMIS-LUNDBRECK CORRIDOR PROJECT: ARCHAEOLOGY IN THE CONTEXT OF PLANNING IN THE CROWSNEST PASS

By
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INTRODUCTION

In 1977, in response to pressures to allow subdivision of lands for country residential housing, the Municipal District of Pincher Creek No. 9 proposed the creation of the Burmis-Lundbreck Corridor Special Area. The intent of this proposed zoning change was to enable the development of acreages, within specific restricted conditions, throughout the defined area and thereby reduce pressure for such facilities elsewhere in the district. Alberta Culture was contacted prior to revision of the plan in 1984 to provide comments regarding possible damage to historical resources resulting from potential development.

The Burmis-Lundbreck Corridor is a 41 km^2 (16 section) area straddling the Crowsnest River from the point at which the river leaves the main pass and traverses a rugged foothills zone to enter the Plains near Lundbreck (Figure 24). The region defined by the planning area contains 74 previously recorded prehistoric sites and several historic period sites. The vast majority of these sites were identified in the early 1970s by survey crews from the University of Calgary (Reeves 1974a, 1974b, 1974c). Assessment at that time was strictly limited to visual and surficial observation. A lack of systematically collected information regarding the significance of these sites and the fact that most occur on private lands which could be developed at the discretion of the land owners, provides a potential for conflict of considerable scale. This is especially true when the potential presence of additional undetected sites is considered.

It was reasonably clear that further field studies to refine impressions of the significance of known sites and to assess the potential of terrain features for additional finds would be necessary to

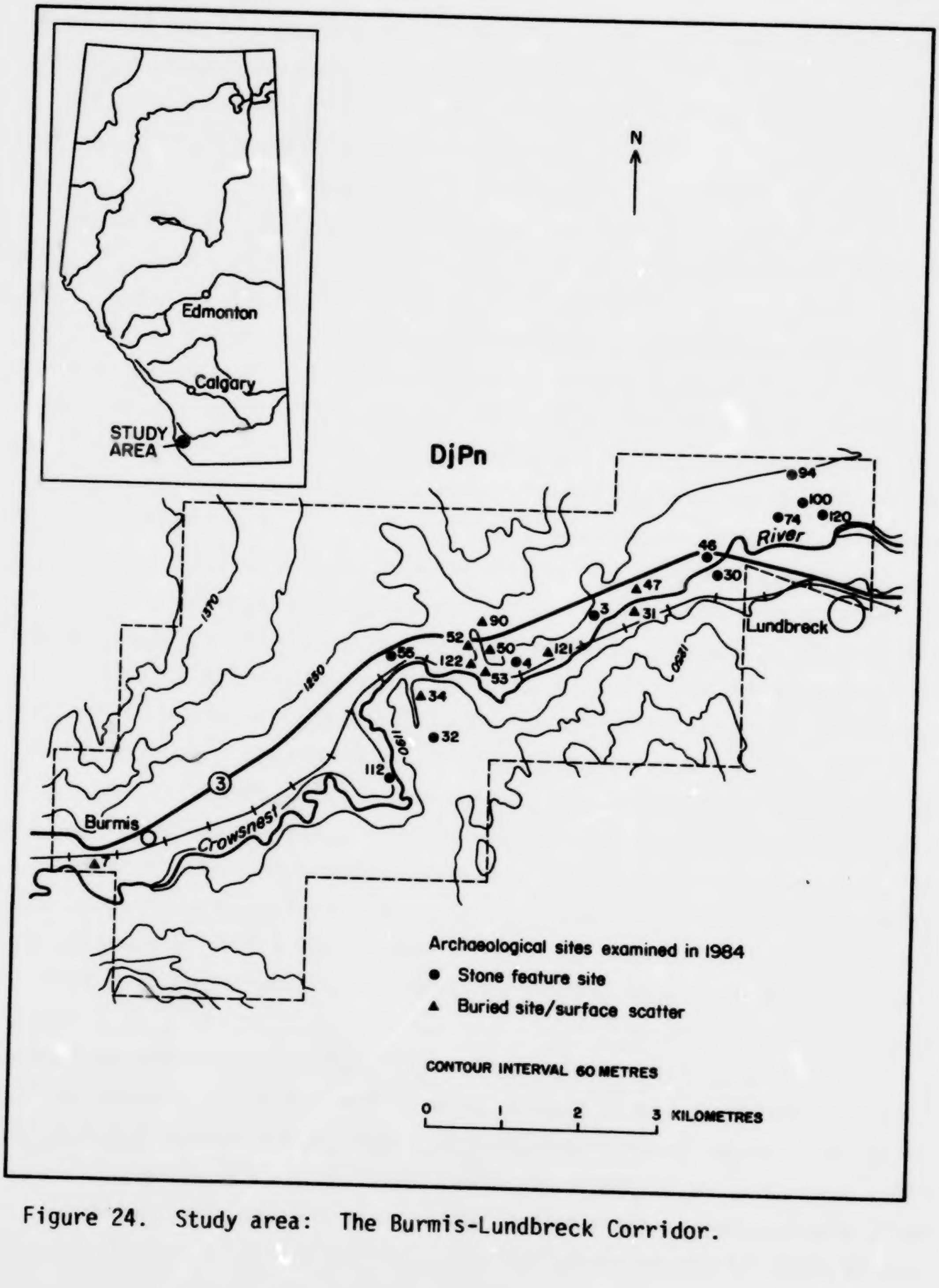

Edmonton
Calgary
STUDY AREA
N
DjPn
94
100
74
120
River
46
30
47
3
31
Lundbreck
90
52
50
121
56
122
4
53
34
32
112
3
Burmis
Crowsnest
7
1370
1250
1190
1250
Archaeological sites examined in 1984
● Stone feature site
▲ Buried site/surface scatter
CONTOUR INTERVAL 60 METRES
0 1 2 3 KILOMETRES

Figure 24. Study area: The Burmis-Lundbreck Corridor.

effectively accommodate both the intent for preservation of the Alberta Historical Resources Act and the rights of landowners to develop their land in as unencumbered a fashion as possible. This report details the initial phases of an in-field archaeological program adopted by the Archaeological Survey of Alberta to achieve these ends.

ENVIRONMENTAL LANDSCAPE

The Burmis-Lundbreck Corridor is located in the foothills of the southern Alberta Rocky Mountains. In this region, the foothills are a narrow belt consisting primarily of folded and faulted Mesozoic sandstones and shales. Exposed bedrock ridges are a prominent feature in the corridor in a landscape heavily modified by glacial and post-glacial activities. Glacial features include till plains, glacial flutes, and kame terraces. Post glacial features are represented by outwash plains, glacio-lacustrine deposits in the extreme eastern portion, alluvium, colluvium and land slide deposits (Alberta Research Council 1980). This diversity provides considerable topographic variation which must have influenced, to a great extent, prehistoric occupation of the area.

Climatically, the corridor is situated in a zone where the interplay between the two dominant Alberta air masses, Mild Pacific and Polar Continental, is most dramatic. Characterized by high velocity winds throughout the year, the foothills area east of the Crowsnest Pass has perhaps the most frequent occurrence of winter Chinook winds anywhere in Alberta. The frequency and duration of warm westerly flow maintains relatively arid summer conditions and keeps the surrounding slopes free of snow throughout the winter.

A combination of low elevation, frequent winds and well drained soils results in the dominance of prairie grassland communities. Arboreal species are limited to deciduous gallery stands in the river bottoms, limber pine on exposed ridges and mixed conifers on a few north and east facing slopes. Due to favorable climate and vegetation, the southern Alberta foothills are known to have been a prime wintering area for plains bison herds throughout prehistoric times. The Burmis-Lundbreck Corridor, with its combination of shelter provided by bedrock ridges and incised valleys and exposed grassy slopes, would have provided an excellent seasonal habitat for a variety of ungulates.

PREVIOUS ARCHAEOLOGICAL STUDIES

The valley of the Crowsnest River is one of the most intensely studied areas in western Canada. Historical resource sites inventories conducted by the University of Calgary in 1972, 1973, 1974 (Reeves 1974a, 1974b, 1974c; Driver 1976; Loveseth 1976) have been augmented by both research oriented field school excavations by the same institution (Reeves 1974b, Quigg 1975b; Driver and Loveseth 1977; Graspointer et al. 1978), and conservation oriented excavations at sites threatened by construction activities (Reeves 1974a, 1974b; Quigg and Reeves 1975; Reeves, Calder and Head 1976, 1977). These studies have produced reports that are almost exclusively descriptive, with interpretation restricted to culture historical inference.

Several studies of a more synthetic nature have produced four M.A. theses and one Ph.D. dissertation at the University of Calgary (Duke 1978; Kennedy 1979; Loveseth 1980; Ronaghan 1980; Driver 1978). Driver's work is the most relevant for the present study, since it places the Crowsnest sequence into the established culture historical framework for the Northwestern Plains/mountains area as defined by Reeves (1983a). Furthermore, site distributional patterns are discussed in terms of a projected exploitation model which focuses on seasonal herd movement as the major determining factor.

The herd hunter model views the valley of the Crowsnest as a closed system in which prehistoric hunting groups could have exploited seasonally available ungulates year round, in three topographically defined basin areas from Lundbreck west to the continental divide. The Burmis-Lundbreck Corridor is the most easterly of these basin areas and was presumably used to exploit, almost exclusively, bison herds present in winter and early spring (Driver 1978, n.d.). Other seasons would find prehistoric groups following indigenous mountain ungulate herds both westward and to higher elevation. Driver believes this combined lateral and elevational cyclic movement pattern persists throughout the entire prehistoric record in the area.

Site seasonality in this model is based upon faunal analysis of assemblages from two of the three excavated sites in the Burmis-Lundbreck area and 18 other excavated sites in areas further west (Driver n.d.). Two of the sites, the S.S. Burmis site (DjPn-62; Quigg 1975b) and DjPn-9 (Quigg and Reeves 1975) are stratified valley bottom campsites in the corridor but are not totally representative of the variation there. It should be noted that Driver does not suggest that single season exploitation characterizes the entire eastern portion of the Crownest Pass, but neither does he explore other possibilities. The simple high frequency of exposed surface camps in the area is suggestive of a situation much more complex than the model allows. Nevertheless, it remains a viable construct against which additional observations can be measured.

STUDY OBJECTIVES

Because it was simply proposed to make zoning changes to the Burmis-Lundbreck Corridor plan rather than involving specific proposed developments, it was felt that an area wide archaeological study could provide coordinated directions to potential developers at a planning stage and thereby ensure avoidance of conflicts between future developments and significant resources.

Although recorded prehistoric and historic sites potentially occupy large tracts of land in the area, very limited knowledge is available regarding their significance. Consequently, it is difficult to determine how much concern should be expressed over the potential loss of specific sites. The primary objective of the study was to provide substantive information toward an effective determination of site significance on both a local and a regional level. This latter aspect is seen as being particularly useful for management of endangered resources in other areas of the Alberta Foothills.

Assessment of the current state of archaeological knowledge in the Burmis-Lundbreck Corridor suggested that initial surveys, although surficial in nature, had been relatively thorough. Additional sites, if present, would likely occur in deeply buried contexts. As a secondary objective, it was felt that a subsurface assessment program at known sites would provide more substantive knowledge to assess the potential of various terrain features for deep site burial. Such potential locations could then be examined in later stages of this or other future studies.

METHODS

Sites in the study area essentially occur in two forms: surficial stone feature sites (tipi rings, cairns, alignments) and surficial or buried sites whose constituents consist of lithic artifacts, bone and/or fire cracked rock. Two quite different field methodologies for these two main site types were adopted at this initial phase of the project in order to permit the establishment of a first approximation of site significance and appropriate management decisions for both types of site throughout the planning area.

A review of the site files on the stone feature sites suggested that, like many other such sites on the Plains, artifacts would be either absent or extremely rare. It was reasoned, therefore, that the value of these sites would likely depend on their state of preservation, extent of burial, and configurational information (i.e., site size, number of features, and structural characteristics). Systematic recording of these data and mapping of the features in relationship to surrounding terrain was adopted as an expedient method of providing the basic information on these characteristics.

A recording form listing selected feature attributes was developed. Data categories were modified from Quigg and Brumley's (1984) "limited stone circle recording format", with provisions made for cairns and rock alignments. These include:

1. Feature definition: an arbitrary measure of the degree of confidence felt in positive identification (good, moderate, poor).
2. Extent of burial: an arbitrarily defined attribute with three levels (extensive, moderate, shallow) recorded instead of stone depth (Quigg and Brumley 1984) so as not to disturb features.
3. Diameter (for rings and cairns): Based on establishing ring centres by the method outlined by Quigg and Brumley (ibid.), both inside and outside diameters were measured along N-S and E-W axes. Cairn diameters on both axes were also recorded.

4. Single or double walled rings: observation of number of courses of rocks on rings.
5. Stone counts: These were recorded by quadrants for rings, for entire cairns as visible from surface, and for individual clusters on alignments.
6. Door: a presence/absence attribute recorded on circles only.
7. Hearth: as above.
8. Disturbance: an arbitrary three level attribute (low, moderate, high) assigned to all features.
9. Topographic feature: the site locational characteristics (six classes).
10. Nearest water source: any water source within a .5 km radius.
11. Aspect: site facing direction.

The methodology adopted for assessment of buried sites and surface scatters of cultural materials was far less structured prior to field activities. It was intended that each site would be visited, visually examined and an appropriate site specific subsurface testing program initiated. Standard excavation techniques were to be employed, including screening of all sediments. Upon completion of excavations, a site map was to be made using transit and rod, plotting test locations, legal features and major terrain intervals.

It was hoped to apply the above outlined techniques on a region wide basis in order to attain a representative, comparable sample. Successful regional application would depend in large part on the attainment of permission to enter private lands on which sites are located; unfortunately, some difficulties were encountered in this regard. Furthermore, the number of sites it would be possible to assess would be greatly influenced by their present character and the accuracy of initial reporting. Perhaps the greatest unknown factor was the depth of burial in subsurface sites.

FIELD STUDIES

Field studies were begun in early June 1984 with a crew of three under my supervision. The initial phase of the project involved interviews with various landowners in the area. Known sites were visited in the Lundbreck area. Stone feature sites were visually examined by myself and an experienced assistant. Features were identified and flagged for recording and mapping. Immediately thereafter, the two person mapping crew recorded the sites.

Surficial artifact scatters and buried sites were also visually examined and artifact concentrations were noted. Several sites were determined to be of insufficient value to warrant further study, where the initial impression of sparsity was verified through substantial amounts of adjacent surface exposure (e.g., DjPn-32); initial reports of surficially exposed artifacts were not verified (e.g., DjPn-31); or where subsequent disturbance had damaged substantial areas of the site (e.g., DjPn-7).

Testing at the first site (DjPn-47) utilized systematically placed 50 x 50 cm units, but the substantial depth of culture bearing deposits made this size of unit ineffective. Subsequent excavations at this site and other buried sites employed 1 m x 1 m units distributed in a more judgemental fashion. The nature of sediments at some sites provided problems for excavation. For example, the very fine, extremely dense clays encountered at DjPn-47 and DjPn-90 required a pick or mattock for removal and produced balls in hand or power screens. Where there was a high water content in such soils, excavation was somewhat easier but screening was much more difficult.

Excavation was generally conducted by shovel except where features and/or bone or artifact concentrations were encountered, when troweling replaced shovels. In one case (DjPn-90), a backhoe was used to excavate stratigraphic trenches. All sediments were screened through 6 mm (1/4") wire mesh hand or power operated screens. Profiles were drawn of all excavation units. When excavations were complete, sites were mapped by transit and rod. All excavation units were backfilled by hand.

RESULTS

In the course of the 1984 field season it was not possible, for a variety of reasons, to fully evaluate all the known sites in the Burmis-Lundbreck Corridor. Nor was it possible to provide an adequate assessment of terrain potential for deeply buried sites throughout the area. Nevertheless, a total of 21 sites were visited (Table 10). Of these, 11 were surficial stone features sites; 10 of these were mapped and 7 were recorded according to the format previously discussed. Nine buried sites were visited; four of these were mapped in detail and one was sketch mapped. Five buried sites were test excavated and one stone feature site had a single test unit placed on it. Table 10 displays the results of the 1984 field season.

The field data have not been fully analysed at this point; consequently, only preliminary analytic results and general impressions regarding site significance can be provided.

STONE FEATURE SITES

The most common feature at these types of sites are stone circles. They are presumed to represent the remains of tipi residences occupied for relatively short periods of time (Kehoe 1960; Finnigan 1982; Quigg and Brumley 1984). The observations recorded for these features were made under this assumption and were intended to measure variation in those examined.

Within a sample of 75 recorded rings, only 17% were well defined, with the largest proportion (61.9%) being moderately well defined, and 22% were poorly defined (Table 11). Although the criteria involved in classifying these rings are arbitrary and therefore not comparable to data in other nearby areas, it is suspected that many stone circle sites located on outwash terraces in the region will display a similar distribution tending toward moderate and poorly defined individual circles.

Cairns and alignments are much less common features in the sites examined. Cairns generally range from moderately to poorly defined. DjPn-112, the Entrance Cairns site, exhibits large, primarily well defined cairns; this site is discussed with buried sites because of its unique character and subsurface component. Alignments existed at two sites (DjPn-30 and DjPn-74) but were generally poorly defined.

The recording of arbitrarily defined categories for feature burial was thought to provide an alternative to measuring rock depths. However, the categories established proved not to be sufficiently discriminatory

Table 10. Burmis-Lundbreck Corridor sites examined during 1984 field program.

A. Stone Feature Sites

Known Sites	Mapped	Recorded	Tested
DjPn-3	-	-	-
DjPn-4	x	x	-
DjPn-30	x	x	-
DjPn-32	x	x	-
DjPn-46	x	-	-
DjPn-55	x	x	-
DjPn-74	x	-	-
DjPn-94	x	-	-
DjPn-100	x	x	-
DjPn-112	x	x	x
New Sites			
DjPn-120	x	x	-

B. Buried Sites

Known Sites	Mapped	Tested
DjPn-7	-	-
DjPn-31	-	-
DjPn-34	-	-
DjPn-47	x	x
DjPn-50	x	x
DjPn-52	-	-
DjPn-53	x	x
DjPn-90	x	x
New Sites		
DjPn-121	-	-
DjPn-122	x(sketch)	x

Table 11. Stone feature definition.

A. Stone Circles

	Poor	Moderate	Good	Total
DjPn-4	4	7	2	13
DjPn-30	5	17	8	30
DjPn-32	1	2	0	3
DjPn-55	7	14	0	21
DjPn-100	0	3	2	5
DjPn-120	0	3	1	4
Total	17	46	13	76
%	22	61	17	100

B. Cairns

	Poor	Moderate	Good	Total
DjPn-30	2	2	-	4
DjPn-55	1	-	-	1
DjPn-112		1	15	16
Total	3	4	15	21

to measure variation within the sample examined. With minor exceptions, all features were recorded as being extensively buried, that is, only the tops of most rocks were visible above the surface. It should be noted that examination took place in early and mid summer when vegetation was fully developed. Examination in a different season may have resulted in a different evaluation.

With the exception of a few categories of environmental features, the balance of the observations made relate strictly to stone circles. The characteristics recorded can be used to examine a number of propositions regarding construction of these features, derived from both previous knowledge and ethnographic records. Detailed analyses of the data collected on circle diameters and stone clustering by sector have not yet been conducted. General summary information on those two characteristics is presented in Table 12.

Variations in stone circle diameters may reflect seasonal differences in construction techniques or chronological or cultural differences (e.g., horse vs. dog transport). For example, elongation of one of the axes might reflect prevailing wind direction. As can be seen from an examination of mean inside and outside diameters (Table 12), considerable variation is present in the size of these features, and variation within sites appears to be as great as between sites. It is not believed that these data are sufficiently patterned to infer seasonal or chronological differences between sites. For example, although prevailing winds in the study area were undoubtedly from the west in most seasons, circle diameters do not show a constantly greater east/west axis which would reflect presumed construction techniques.

Clustering of rocks on one side may indicate the prevailing wind direction, since it has been suggested that greater weight was used on the windward section of the ring. Conversely, a lack of rocks may suggest the downwind positioning of a doorway. Unfortunately, there is considerable inconsistency in the stone clustering data. Mean high stone counts are most common along the southern and eastern portions of the circles rather than the north and west as would be expected (Figure 25). Thus, the high degree of variation suggests that no particular pattern is present, at least when the means across sites are considered.

Table 12. Configurational information for stone circles.

Mean Diameters

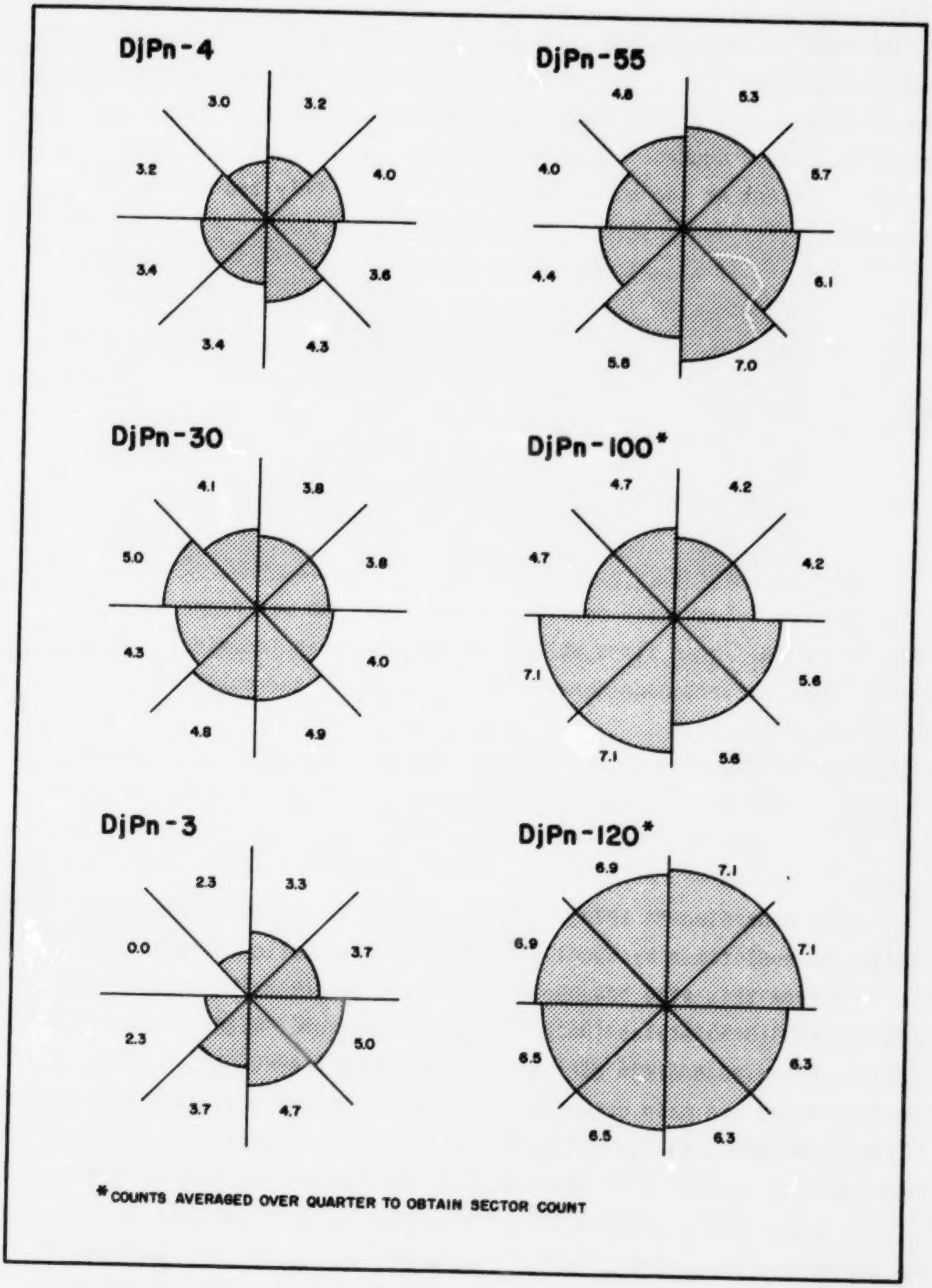
Site	Number of Features	INSIDE N/S		INSIDE E/W		OUTSIDE N/S		OUTSIDE E/W	
DjPn-4	13	4.83	.56	4.83	.58	5.64	.67	5.54	.61
DjPn-30	29	5.19	.69	5.43	.80	6.28	.64	6.47	.77
DjPn-32	3	5.11	.21	5.03	.57	5.81	.24	5.80	.51
DjPn-55	21	5.86	.72	5.76	.50	6.82	.76	6.63	.55
DjPn-110	5	5.72	.98	5.54	1.02	6.96	1.19	6.60	1.03
DjPn-120	4	5.64	1.08	6.60	.91	6.76	.81	7.77	.73

Stone Clustering by Sector
Mean Counts by Site

Site	Number of Features	1	2	3	4	5	6	7	8	Aspect
DjPn-4	13	3.2	4.0	3.6	4.3	3.4	3.4	3.2	3.0	S
DjPn-30	29	3.8	3.8	4.0	4.9	4.8	4.3	5.0	4.1	N
DjPn-32	3	3.3	3.7	5.0	4.7	3.7	2.3	0	2.3	W
DjPn-55	21	5.3	5.7	6.1	7.0	5.8	4.4	4.0	4.8	S
DjPn-100	5	4.2	4.2	5.6	5.6	7.1	7.1	4.7	4.7	E
DjPn-120	4	7.1	7.1	6.3	6.3	6.5	6.5	6.9	6.9	S

Additional Features

Possible Door Evidence DjPn-30, Ring 4; DjPn-120, Ring 4
Possible Hearth Evidence DjPn-30, Rings 4, 15, 17; DjPn-120, Ring 1



*COUNTS AVERAGED OVER QUARTER TO OBTAIN SECTOR COUNT

Figure 25. Mean rock counts by sector.

Whether the stones were arranged in a single or double course might indicate whether both a tent cover and an interior liner were being held down. However, no circle observed in this study appeared to have a double course of stones. Apparent doorways and hearths were also generally absent at the stone circles examined. Only two of the 75 recorded circles had possible doors and only four had possible hearths. This absence of structural features seems quite characteristic of stone circles in this area, as it is throughout most of the Plains. It is also generally characteristic that no artifacts were observable on surface within or near stone circles. This fact made functional and chronological interpretation impossible with this level of information.

BURIED SITES

Five buried sites were evaluated by test excavations during the 1984 field program. Four were previously known and one was found during the 1984 fieldwork. These sites will be discussed on an individual basis, because each differs considerably in stratigraphy and cultural characteristics.

Because analysis of the field data is not complete, descriptions will be of a brief summary nature.

DjPn-47

First identified in 1973, this site (Figure 24 and 26) has been visited several times by local collectors. Diagnostic projectile points recorded from this site have been identified as Besant (N=3) and late side notched (N=1) styles (Hackler, 1974). Cultural materials had been exposed by drainage ditch excavations at the base of several narrow terraces above the main outwash terrace north of the Crowsnest River.

When the site was revisited in 1984, only low numbers of artifacts, bone and fire cracked rock were observed on the surface. Nevertheless, initial shovel testing north of the ditch was productive, and resulted in the systematic placement of 50 x 50 cm units and several larger units (1 x 1 m, 1 x 2 m, 2 x 2 m) over a considerable portion of the site area. In all, a total of 15.25 m^2 of site area was examined.

Figure 26. DjPn-47: view east toward Lundbreck; site in aspen in centre of photo.

DjPn-47 is a deeply buried stratified prehistoric site located on the narrow terraces above the main terrace of the Crowsnest River. The test excavations undertaken in 1984 suggest that it is minimally 60 x 120 m in size and is potentially much larger. The natural sequence of deposition at DjPn-47 is quite complex and includes the presence of basal lake or pond deposits in some areas and outwash gravels in others (Figure 27). The presence of isolated peat deposits on the upper terrace and linearly oriented deposits provisionally identified as Mazama Tephra directly down hill suggest a now defunct and infilled spring. The balance of sediments are heavy colluvial clays.

Cultural materials are not well separated and occur throughout the upper members of the natural deposits in varying depths from near surface to as deep as 110 cm in some areas. These are generally sparse and consist primarily of bone, although some lithics occur.

Projectile point styles recovered together with certain natural stratigraphic features enable the postulation of possibly four

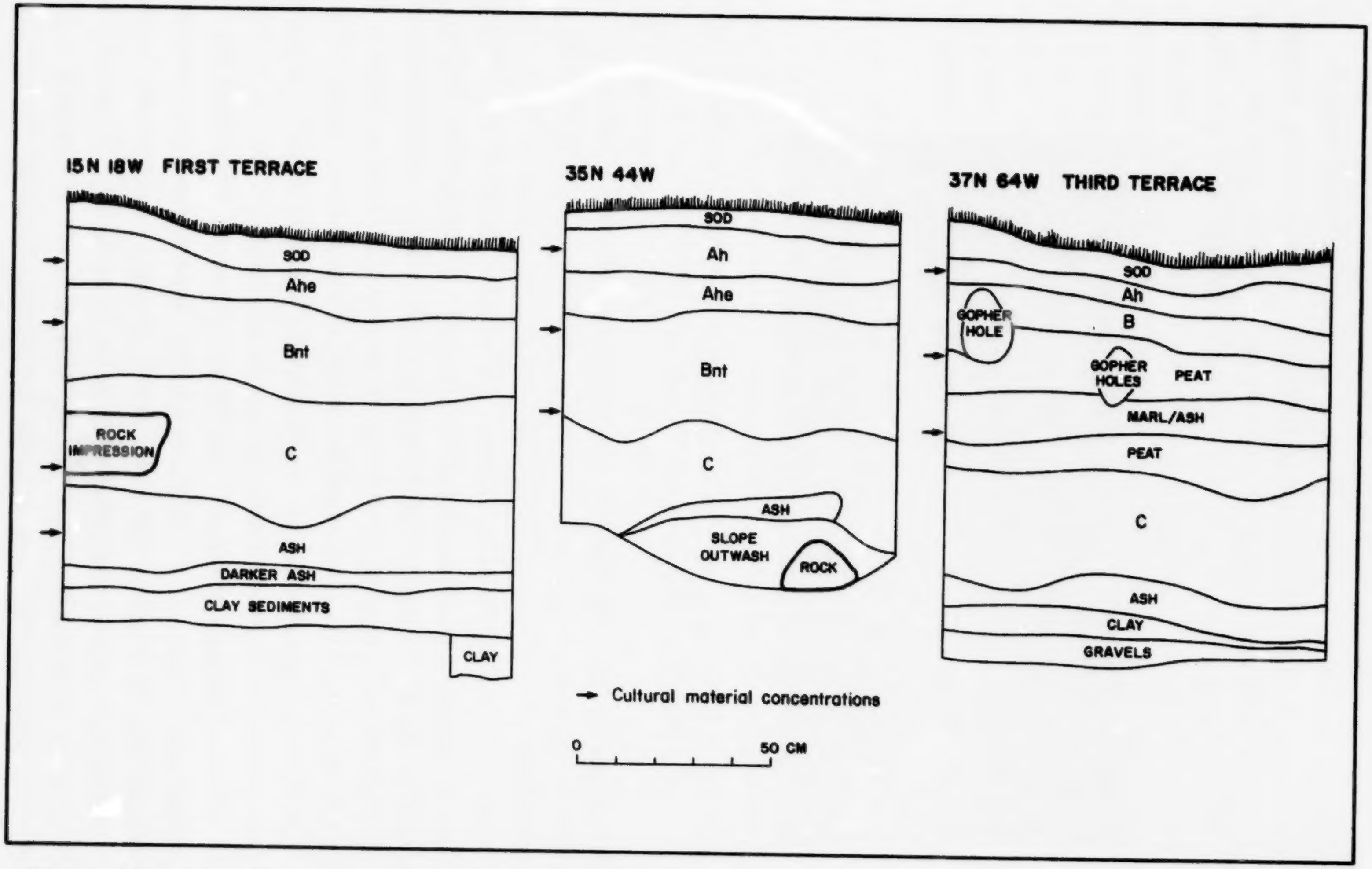

15N 18W FIRST TERRACE
SOD
Ahe
Bnt
ROCK IMPRESSION
C
ASH
DARKER ASH
CLAY SEDIMENTS
CLAY
35N 44W
SOD
Ah
Ahe
Bnt
C
ASH
SLOPE OUTWASH
ROCK
37N 64W THIRD TERRACE
SOD
Ah
B
GOPHER HOLE
GOPHER HOLES
PEAT
MARL/ASH
PEAT
C
ASH
CLAY
GRAVELS
→ Cultural material concentrations
0
50 CM

Figure 27. DjPn-47: representative profiles.

occupational episodes, from perhaps greater than 7,000 years ago to as late as a few hundred years ago. In chronological order, these are:

1. Early Mid-Holocene - This occupation is defined by the presence of sparse faunal materials in stratigraphic position below Mazama Tephra. It was noted to occur in three excavations in the central portion of the site. Bone has been submitted for radiocarbon dating, and should provide confirmation of a presumed age of greater than 6,800 years (based on the date of the Mazama ashfall [Bacon, 1983]).
2. Hanna - Although not well defined, a concentration of cultural materials including at least one hearth may be associated with a Hanna style projectile point (Figure 28a) recovered at a depth of about 60 cm below surface. It should be noted that Driver's definition of both the later part of the Maple Leaf subphase (4500-3000 B.P.) and the Burmis subphase (3000-1500 B.P.), in the Crowsnest contain a Hanna- Pelican Lake co-association, suggesting some mixing. Nevertheless, if this component is discrete, as it is on the Plains, it would probably date around 4500 B.P. or slightly earlier (Reeves 1983).
3. Pelican Lake - Again poorly defined, a concentration of cultural materials occurred at a depth ranging from 30 to 40 cm below surface. Although primarily faunal material, this concentration produced a single Pelican Lake style point (Figure 28b). Occurring at similar depths elsewhere on the site, were one hearth and three fire cracked rock clusters which probably represent disturbed hearths.
4. Late Prehistoric - This component is defined on the basis of a single ceramic sherd recovered (Figure 28h) from the upper most levels of the site and a nearby surface find of a late side notched point (Figure 28d). Sparse amounts of faunal materials and fire cracked rock characterize this occupation.

These components are defined only on a provisional basis for a number of reasons: diagnostic artifacts are scarce, dates have not been processed, definite floors were not recognized and rates of sedimentary deposition are not considered reliably consistent. They should be considered preliminary constructs requiring further definition.

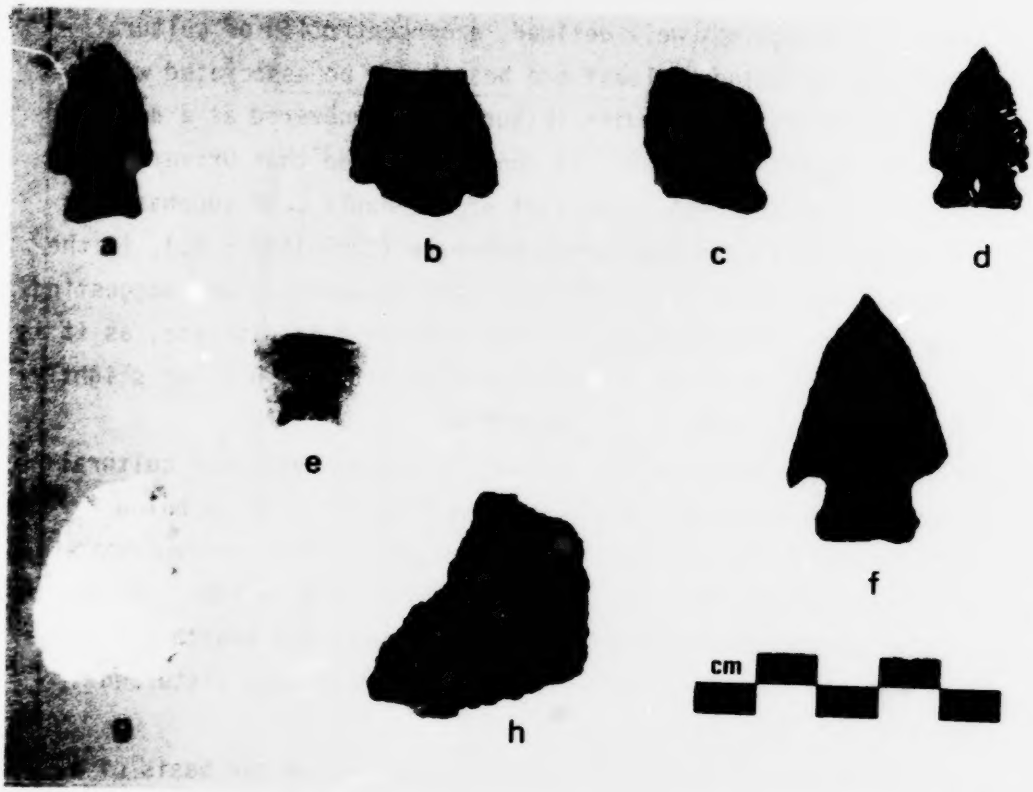

a
b
c
d
e
f
g
h
cm

Figure 28. Selected artifacts from Burmis-Lundbreck Corridor study.

It is felt that difficulties in recognizing the discreteness of occupations coupled with the general sparsity of cultural materials, poor bone preservation and the heavy clay and moisture content of the soils, all contribute to an initial impression that the site is not of extraordinary significance to the prehistory of Alberta. However, more in-depth analysis may alter this impression.

DjPn-50

DjPn-50 (Figure 29) was identified in the 1973 University of Calgary survey (Reeves 1974b) and was visited again by an amateur archaeologist the following year (Hackler 1974). These investigations described the site as a buried camp or a possible workshop. Cultural materials including flakes, detritus, an Agate Basin style point, a scraper, bone and fire cracked rock were observed to be present in a blow out on the side of a hill near the entrance of the deeply incised (30+ m) channel of Rock Creek to the Crowsnest River. Surficial and possibly buried material (20 to 30 cm B.S.) exposed in a cut suggested that the site might have several components.

Located in the lee of a bedrock ridge dipping slightly eastward, the site is in a very exposed location but has a spectacular view of the main valley as far west as Burmis. Exposed cultural materials appeared to be limited to an area around a small circular bedrock ridge approximately 60 m east of Rock Creek ravine. South of this area, an east/west trending saddle exists; then the bedrock rises again, finally descending into the Crowsnest Valley. It was felt that the depressed areas, especially the saddle, might contain better preserved, more deeply buried, possibly stratified cultural deposits (Figure 29).

Eight 1 x 1 m tests were located judgementally over the site area in order to investigate a variety of depositional contexts on this rather complex landform. Initial testing focused on depressed areas south and east of the erosional exposures. Additional tests were placed near the ravine to the west and, finally, tests were excavated near the limited surficial exposures of artifacts.

Natural deposition at DjPn-50 shows considerable variation in depth but would appear to represent a single set of processes involving decomposition of the surrounding soft sandstone bedrock and redeposition

Figure 29. DjPn-50: view east. Surficial artifacts located near base of small hill with pine behind excavation. Deeper deposits were identified in depressed area to left of centre.

of the resulting fine sands into topographic low spots by slope wash and aeolian processes. The bedrock substrate was encountered in four of the units at depths varying between 25-85 cm below surface, but units sited in the more depressed areas were unable to attain sufficient depths. Fine grained aeolian sands and silts overlie bedrock and vary in depth to over 180 cm in the saddle like depression.

The deposition of the sands and silts appears to have been sufficiently uniform so that no stable surfaces could be recognized in excavation, either in plan or in profile. Very limited evidence for vertical separation of cultural materials was noted in the excavations. Units excavated in both the northern and southern portions of the examined site area produced a sterile 10 cm interval between 20 and 30 cm below surface, thus separating culture bearing sediments. Cultural materials recovered at DjPn-50 are so sparse, however, that neither of these two potential occupations can be characterized. This is especially true because intervening units in the central portion of the site revealed no such separation. The presence on surface of an Agate Basin style lanceolate point suggests a possible Early Prehistoric Period presence, but this can not be correlated with any buried materials. No other chronologically sensitive specimen was recovered at DjPn-50.

Cultural materials consist largely of lithic items which confirm Hackler's impression of the site as a small workshop. The density of lithic artifacts in excavations at DjPn-50 averages 5.6 items per square metre indicating the general sparsity. Faunal elements are extremely fragmentary and exhibit similar density. For these reasons, little interpretation can be attempted.

Unless major concentrations remain to be identified at DjPn-50, it is believed that the site represents periodic visits by very small groups, probably over a long period of time. Activities appear to represent limited working of stone and possibly some camping. The site location high above the valley suggests a game observation locale, most probably suitable for warm season occupation.

DjPn-53

DjPn-53 was first recognized in 1973 during the University of Calgary inventory (Reeves 1974b). At that time, it was noted that bone was eroding from a buried soil horizon approximately 5 feet (1.5 m) above the bed of Rock Creek, about 200 m north of its junction with the Crowsnest River (Figure 24). It was classified as a paleontological site, but the possibility that it could be a kill deposit was noted in the initial descriptions. In this area, Rock Creek has incised a very deep (30+ m) ravine into the soft sandstone bedrock. This is the same ravine which DjPn-50 overlooks approximately 200 m upstream.

The site and its eroding bone was re-examined in 1984 (Figure 30). It was selected for test excavation due to its possible cultural origin and the potential significance of this rare type of site (i.e., kill site) in the region. The site area consists of a flat narrow floodplain terrace on the east side of the creek (ca. 100 x 15 m) and a small similar terrace (ca. 40 x 30 m) on its west side. Directly south of this location, the ravine disappears into the flat low terraces of the Crowsnest River. The spot would be ideal for driving and entrapping small groups of ungulates.

Figure 30. DjPn-53: view southeast; site deposits on terrace in bottom of ravine.

Five 1 x 1 m excavation units were placed judgementally on this site, four on the east side of the creek and one on the west side. These were fairly easy to excavate because of the silty nature of the soils. Each unit was excavated to a depth between 90 and 140 cm below surface, when movement in units of this size became difficult, and materials of a potential cultural origin became sparse or absent.

The natural sequence of deposition at DjPn-53 appears to represent a series of alluvial episodes involving both sorted and rounded gravels and fine silts. Because of the possible lateral variation in stream bed deposits, it is not considered possible, without absolute dating, to confidently correlate the natural episodes exhibited in the profile.

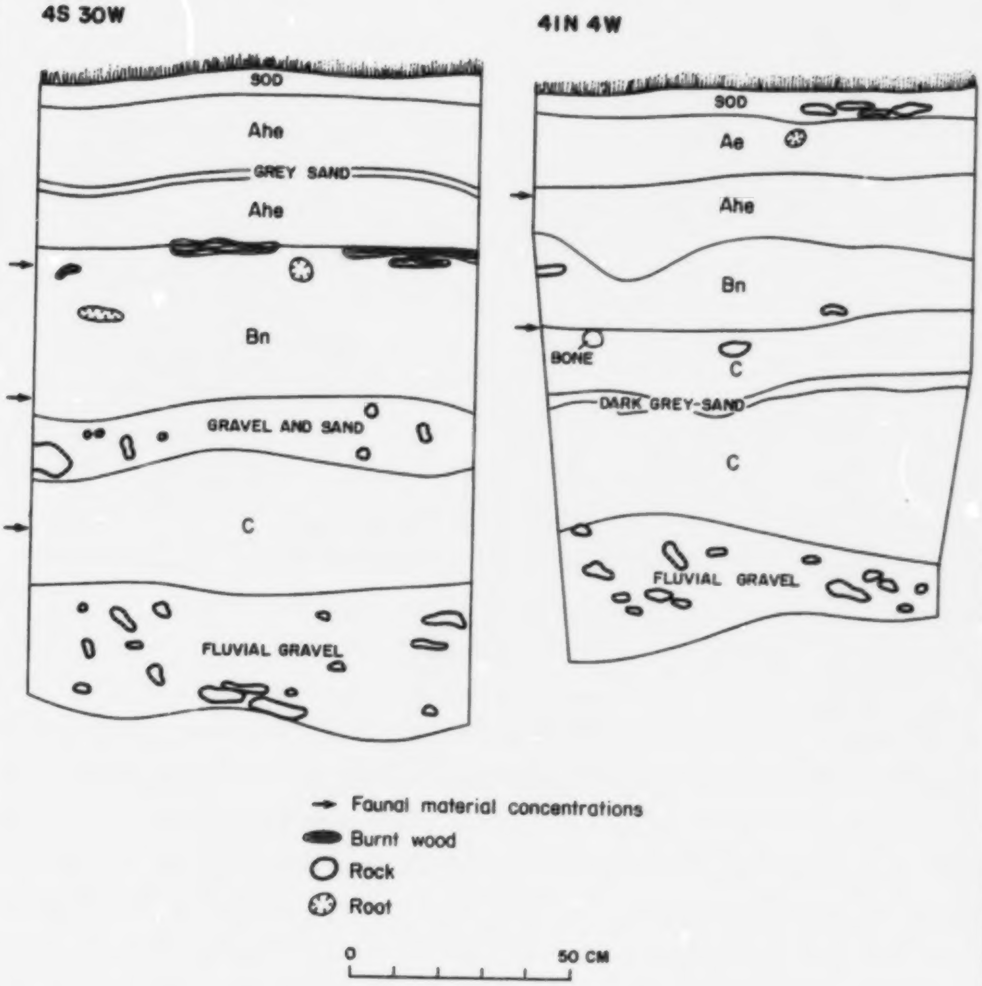
The basal unit in most of the excavations consists primarily of well sorted, rounded gravels. In the southern and western part of the site, two such units, in the lower portion of the excavations, were separated by approximately 15 and 45 cm of flood silts. Gravels occur at depths below surface ranging from 60 cm and 100 cm in various locations on the site. Fine grained flood silts generally overlie gravels and constitute the bulk of the possibly culture bearing deposits at DjPn-53. It is presumed that these represent overbank deposits possibly laid down when either ice or other material blocked drainage in this narrow valley (see Figure 31).

The interdigitation of both units in the southern and western part of the site suggests temporal variation in stream energy or spatial variation in the position of the bed. In several instances, cessation in the deposition of the silts allowed development of shallow soils indicative of stable surfaces. In some cases, these surfaces are associated with the presence of faunal materials suggesting human occupation, but not in sufficient consistency to allow overall site correlation.

The question of the potential cultural origin of the site is still essentially unresolved. The excavations at DjPn-53 produced no lithic artifacts or cultural features. Fire cracked rock in limited quantity was associated with faunal materials in three of the units, but this is not viewed as unequivocal evidence of human presence.

The fire cracked rock aside, the only form of potential cultural material is the faunal material. Although faunal analysis is not complete at this time, an initial overview failed to reveal any definite evidence of human alteration. Limited positive evidence for a cultural origin exists in three features: 1) species represented consist almost exclusively of large ungulates, probably bison; 2) elements represented consist, in large part, of axial and lower limb elements, suggesting a typical butchering pattern; 3) the quantity and horizontal and vertical distribution of the remains suggests a more catastrophic and repetitive set of processes than would be expected under natural circumstances. Furthermore, secondary deposition does not seem likely as elements are not generally rounded or sorted by size and are reasonably well preserved.

Concentrations of faunal materials were noted in excavations at various depths in several units (Figure 32). In two units, these concentrations appeared to be associated with buried stable surfaces, at 40 and 60 cm below surface. In other units, concentrations did not appear to be associated with any buried soil. Between two and four concentrations of faunal remains were observed in each unit excavated.


4S 30W
SOD
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GREY SAND
Ahe
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GRAVEL AND SAND
C
FLUVIAL GRAVEL
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Ae
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Bn
BONE
C
DARK GREY-SAND
C
FLUVIAL GRAVEL
Faunal material concentrations
Burnt wood
Rock
Root
0
50 CM

Figure 31. DjPn-53: representative profiles.

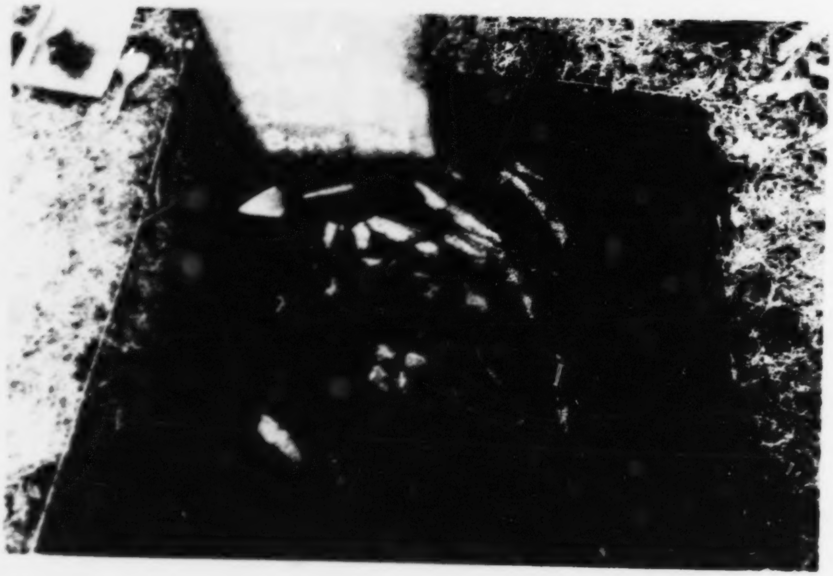


Figure 32. DjPn-53: bone bed detail.

More complete analysis may reveal the nature of the deposits at DjPn-53 and more fully confirm their cultural origin.

DjPn-90 - The Jensen Springs Site

Identified in 1973 by the University of Calgary survey team (Reeves 1974b), this site was originally described as two separate sites (DjPn-90 and 91), since cultural materials were observed on both sides of a spring (Figure 24). The spring is located in a swale of a high bedrock ridge 60 m above the highest outwash terrace in the main valley (Figure 33). The swale is sufficiently large and well watered to provide an attractive small grazing area, and the view west down the valley allows long range observation of game movement. Situated high above the valley, it is subject to high velocity winds which, in winter, would be particularly brutal for human occupation. However, this very characteristic would have provided open grass areas for the bison normally resident in the shelter of the valley bottoms.

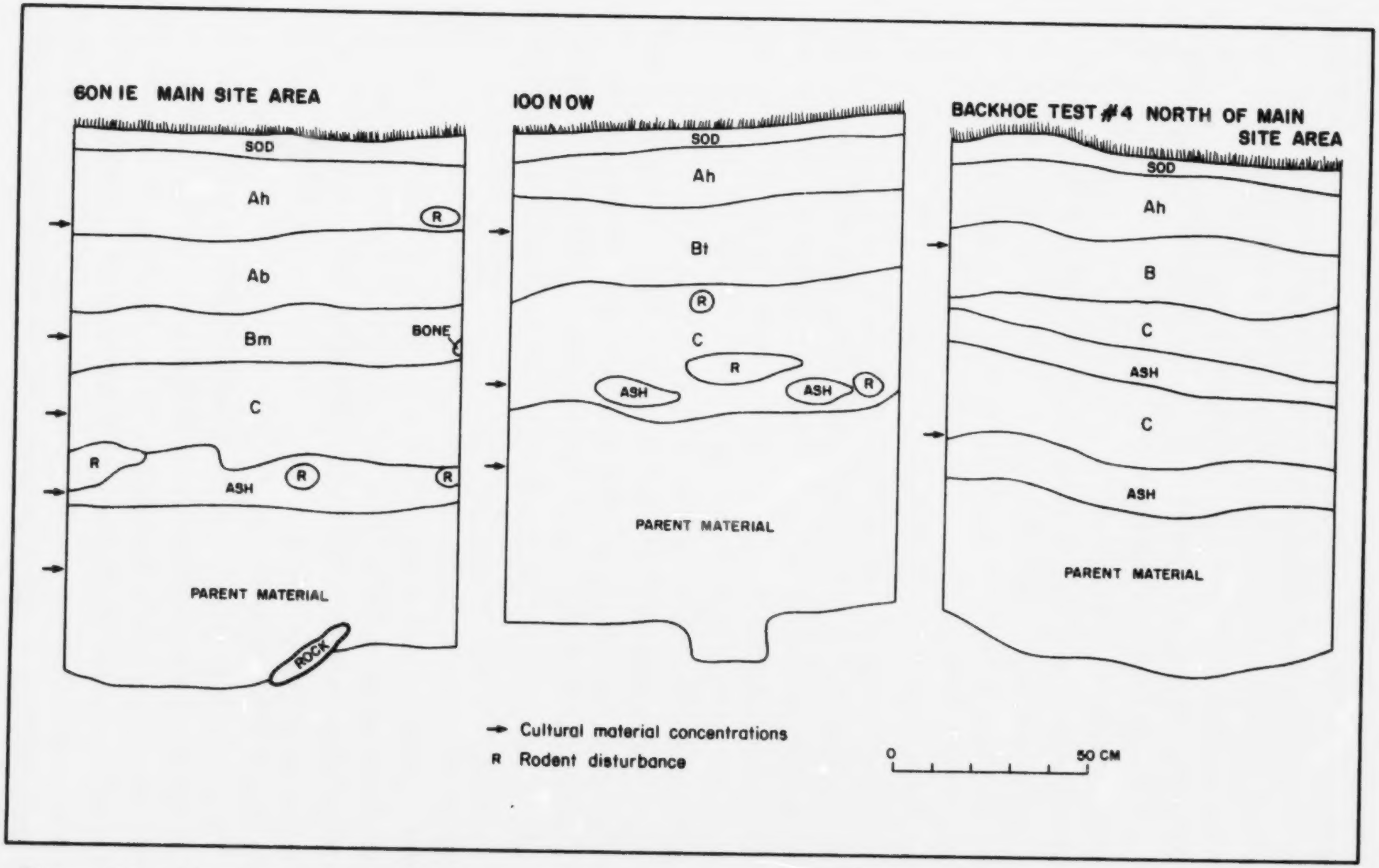
Because the buried cultural materials appear to be distributed fairly continuously over the surface of the swale bisected by the spring,

Figure 33. DjPn-90: view southwest from bedrock ridge above site. Main site area near aspen in centre (note arrow).

it has been decided to drop the dual site designation and refer to the entire area as one site, DjPn-90. It would appear that the point of issuance of spring waters has also varied in time and, therefore, the use of this feature to discriminate sites is not justifiable at present.

Eight 1 x 1 m test excavations were placed in the site area adjacent to the springhead. The results of these and four widely spaced backhoe excavations indicate that the site is of a considerable size, possibly on the order of 300 x 100 m. The results of these excavations are discussed below.

With a single exception, the natural depositional sequence at the Jensen Springs site appears to be the result of a single set of processes continuing to fill in the swale on which the site is located (Figure 34). Sandstone bedrock undoubtedly represents the basal geological unit at the site, but it was probably encountered in only one central unit, at a depth of 140 cm below surface. Because of the fragmentary nature of the feature in this unit, it is not certain whether an extremely weathered surface or rockfall from the cliff above is represented.


60N IE MAIN SITE AREA
SOD
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BONE
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ROCK
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Bt
R
C
R
ASH
ASH
R
PARENT MATERIAL
BACKHOE TEST #4 NORTH OF MAIN SITE AREA
SOD
Ah
B
C
ASH
C
ASH
PARENT MATERIAL
→ Cultural material concentrations
R Rodent disturbance
0
50 CM

Figure 34. DjPn-90: representative profiles.

The major unconsolidated unit at DjPn-90 is composed of fine grained colluvial silts derived from the continental till which blankets the slopes in this area. Reworking of this material by the springs is also evident. This unit contains both the deeply developed modern soil profile and the cultural materials present at the site.

Material provisionally identified as Mazama Tephra lies buried within this deposit and was encountered in three of the excavated units and two of the backhoe trenches dug at this site. It therefore is considered a useful chronological indicator. The most northerly backhoe trench, interestingly, contains two thick bands of this material separated by approximately 20 cm of clay. Chemical analyses of samples collected from these will determine whether two Mazama eruptions, two different sources or interrupted secondary deposition of the same material is represented.

At DjPn-90, as with most of the sites examined in the 1984 field season, sparse recoveries of cultural materials, especially chronologically sensitive specimens, lack of definition in stratigraphically superimposed occupations, poor preservation and difficult soil matrices tend to inhibit the interpretation of prehistoric activities. Examination of the site in 1973 produced a Bitterroot style projectile point, indicating an early Middle Prehistoric occupation dating around 7700-5000 years ago. No illustrations of this point are available for comparison, and no other chronological diagnostic specimen was recovered at that time.

Several possible occupations were identified in the excavations and profiles at DjPn-90, but without a complete analysis, it is not possible to fully characterize these. A low density in lithic artifacts of 3.6 items per square metre over the 8 m^2 excavated seriously inhibits this possibility in any case. However, this sparsity may not be characteristic of the entire site.

The provisional identification of Mazama Tephra in test excavations provides a convenient dating mechanism for materials recovered below it. A rather unusual style of projectile point was recovered in deposits 20 cm below the Mazama layer in a unit sited near the springhead. Resembling a large specimen of the Pelican Lake style, it would appear to be at least 4000 years older than would normally be expected. Its broad blade, very pronounced tangs, deep corner notches and almost stemmed base (Figure 28f) cause it to be quite different from both the classic Pelican Lake expressions defined in Saskatchewan (Wetlauffer 1956) and locally recovered specimens of this phase.

Based on its stratigraphic position, this point more likely represents an early notched variety roughly contemporary with, but stylistically very different from, forms recovered from the Boss Hill site (Doll 1982) and the Hawkwood site (Van Dyke and Stewart 1984) in dated contexts of between ca. 7750 and 8090 B.P., and 8250 B.P., respectively. Both these occurrences are associated with lanceolate styles of the terminal Early Prehistoric Period and both lie below Mazama Tephra. It has been suggested that the Jensen Springs example bears stylistic resemblances to points recovered in a similar chronological situation at the Indian Creek site in Montana by Les Davis (Reeves personal communication 1984), but that material is not presently available for perusal. Faunal material recovered in association with the Jensen Springs point has been submitted for dating, and the results should assist in the interpretation.

Although faunal remains were recovered from five 10 cm levels below Mazama Tephra, no other lithic items were recovered from below the ash in any of the excavation units or backhoe tests. It has consequently been decided to assign only one component to all materials below ash although more might be represented.

The lack of features and artifacts as well as the sparse, poorly preserved faunal remains make it very difficult to characterize the nature of pre-Mazama occupation at the Jensen Springs site. Beyond stating that the exploitation and processing of large ungulates is suggested, very little interpretation can be attempted. The occurrence of faunal materials below ash in backhoe tests at considerable distances from the main site area suggests that this occupation may be the most intensive and dispersed at the site.

The recovery of a Bitterroot style point from the surface of the site in 1973 by the U. of C. team suggests that at least one of the concentrations of cultural materials noted in vertical distribution may relate to a Bitterroot occupation. Considering the dating of this complex throughout Alberta, those concentrations in vertical proximity to the ash may be the most logical ones to associate with the point. However, this proposition is again purely speculative.

All test units contained cultural materials in poorly defined concentrations above Mazama Tephra. These likely relate to several of the culture historical units defined in the regional prehistory. A lack of chronologically diagnostic artifacts associated with any of these precludes specification of the units to which the concentrations might relate. Generally, it would appear from the predominance of rather small lithic artifacts representing mostly debitage that an interpretation of tool production or repair is reasonable.

In summary, the deeply buried Jensen Springs site produced evidence of widely dispersed cultural materials. These are generally sparse, not well separated and not well preserved. These factors tend to diminish the value of the site, but the recovery of a unique, possibly early, notched variety of projectile point in association with probably butchered and processed faunal remains adds significantly to the known occurrences from this period in Alberta. The transition between the Early and Middle Prehistoric periods in this area is not well understood, and the Jensen Springs site may, if further work is undertaken, provide an opportunity to investigate this period in the southern foothills.

DjPn-112 - Entrance Cairns Site

Originally, this site was identified in 1965 by Reeves during a highway survey for the University of Calgary. The site consists of a series of 16 large cobble and slab cairns arranged in a circular fashion around a shallow natural depression on the first terrace above the floodplain of the Crowsnest River (Figures 24 and 35). Reeves' description of the site (ASA site files) suggested possible resemblances to a Kutenai site in the gap of the Oldman River visited by Peter Fidler in 1792. Fidler describes a playing field ringed by piles of rock on which a game was played involving a hoop being rolled over the surface while arrows were thrown at it (Fidler 1792-93:32-33).

The site was revisited in 1984 and the surface was mapped. The depression in which the site is located is not visible until one is virtually upon it approaching from any direction but the east. The area enclosed by the feature is approximately 100 x 150 m. It was reasoned

Figure 35. DjPn-112: the Entrance Cairns site; detail of features along south margin of site. Cairns enclose a central depressed area to left of photo.

that the location may also have been suitable for the construction of a pound to entrap animals. The rock piles could have possibly have served as supports for uprights used to construct such an enclosure.

It was decided to dig a test excavation at the lowest spot near the eastern end of the enclosure, assuming that if animals were driven in from the west or north (where the most grazing area is available), they would have ended up near the low eastern end and been slaughtered there. Even if this was not a reasonable assumption, faunal remains would likely have a wide distribution if it was a kill site, and the most depressed area might produce a stratification of cultural materials.

The excavation produced interesting results. Deposits appear to be very shallow, since outwash gravels were encountered at a depth of ca. 40 cm below surface. The overlying sediments are essentially fine silts on which a chernozemic soil has developed. The cultural materials recovered did not include any faunal materials as was expected under the pound scenario. The upper 10 cm was sterile, but the next level produced one flake, the base of a lanceolate projectile point and several clustered rocks which were identified as a possible hearth feature when exposed in the following level (Figure 36).

The point base exhibits expanding lateral margins, fine flaking and a shallowly indented base (Figure 28e). It is manufactured from a light brown chalcedony, possibly Knife River Flint, a material which is known to occur in other sites in the Pass. The majority of the blade is missing but it has been classified as belonging to the Lusk variety known elsewhere in the region and dating to the terminal Early Prehistoric, around 8000-7500 years ago (Driver 1978).

Only a portion of the rock cluster feature was recovered as it extended into the north wall of the test, but twelve rocks and cobbles of various sizes, some of which were cracked or spalled by fire, were recorded. It is believed that the point and the feature are associated. It cannot be known for certain whether either of these occurrences are associated with the surrounding cairns, since chronological overlap is definitely possible.

The kill site hypothesis has been discarded as it was reasoned that faunal remains resulting from such an activity should have been widely dispersed over the site, especially where deposition is shallow. No bone was observed in the many gopher holes present on the site. The recreational, ceremonial interpretation suggested by analogy to Fidler's account of a similar site remains to be demonstrated. Evidence of a much more specific nature, such as a preponderance of shattered points and absence of domestic activity evidence in the interior, would be required to demonstrate this proposition.

The totally unique nature and arrangement of the surficial features at the Entrance Cairns site is sufficient to consider it to be of significance to the archaeology of the region. The possibility that it represents the physical remains of social/ceremonial activities further augments the significance of the site. Furthermore, if it could be demonstrated that its use was primarily in Early Prehistoric times, the Entrance Cairns site would be an unprecedented window into a specific aspect of early prehistoric social behavior. I would most certainly not push such an interpretation at this time; however, the potential for meaningful research is undoubtedly present at DjPn-112.

Figure 36: DjPn-112: detail of feature recovered in test unit.

DjPn-122

This is a new site discovered near the end of the 1984 field season. It is located on a portion of high outwash terrace isolated to the east by the Rock Creek ravine and to the west by a bedrock thrust which caused a bend in the Crowsnest River (Figure 24). The structure of the bedrock has created a dramatically unusual bowl-like feature enclosed by steeply rising bedrock on all but the east side. The "walls" of the bowl rise 20-30 m above its floor (Figure 37).

Visual inspection of this area resulted in the observation of small numbers of bone fragments in the dirt around several gopher holes. It appeared that this natural feature would have provided a good location for entrapment of small groups of animals. It was also thought that soil deposition in this feature might be substantial, and deeply stratified cultural materials might be present. On the last day of the 1984 field program, a single 1 x 1 m unit was excavated in the central portion of the depression to investigate these propositions.

Results were somewhat encouraging. The uppermost 10 cm level containing the sod and substantial quantities of organic material

Figure 37. DjPn-122: view south from ridge above site. Test excavation in central portion of "bowl" in progress.

produced considerable quantities of large ungulate bone fragments representing a wide variety of elements, a single flake and several fire cracked rocks. Subsequent 10 cm levels produced decreasing quantities of bone and various types of lithics and fire cracked rock, but in low numbers. Cultural materials disappeared below 40 cm in the fine, hard packed clays which constitute the C horizon. The unit was terminated at 70 cm, although deeper deposits may have been present.

No chronologically diagnostic artifacts were recovered in this single test. It is not presently possible to assign any temporal range to the cultural activities represented here. The presence of a sparse lithic suite consisting mostly of debitage allows only the inference that stone tools were used and possibly resharpened in the processing of faunal resources. Faunal materials consist primarily of large ungulate, probably bison; a variety of axial and appendicular elements is represented. Coupled with the presence of fire cracked rock, these remains likely suggest campsite and processing activities rather than primary kill deposits.

Investigating the possibility of deeper cultural deposits would be a time consuming and arduous process due to the density and composition of colluvial clays filling the basin. It would be expected, however, that a level containing inwashed Mazama Tephra would likely be present.

The work conducted at this site in 1984 is not viewed as sufficient to have adequately assessed the potential for productive archaeological inquiry. More work would undoubtedly be necessary to more accurately characterize the nature and chronological framework of the prehistoric occupation at DjPn-122.

CONCLUSIONS

The objectives of the Burmis-Lundbreck Corridor study were twofold: 1) to assess the significance of previously identified prehistoric sites in order to refine levels of concern for their potential future loss; and, 2) to recover information regarding the potential of various terrain features for deep burial of, as yet, unidentified sites. Because the data recovered to date are not completely analysed and the site sample is not representative of the entire study area, concrete statements regarding site significance on an area wide basis are not possible. Preliminary analysis does, however, allow a few generalized statements to be made regarding the character of the resources in the area which may form the basis for future interpretation.

Sites in the area are of two basic configurations: 1) those consisting primarily of surficial stone features; and, 2) those consisting of diverse cultural materials in both surficial and buried contexts. Stone feature sites are invariably located on glacial outwash and more recent river terraces. These locations exhibit extremely limited soil deposition, and naturally occurring cobbles are exposed at many sites. Furthermore, these sites have a tendency toward poor feature definition and an almost total lack of associated cultural materials. These factors make positive identification tenuous in many cases and tend to diminish the value of these sites.

Most of these sites exist in locations exposed to the high velocity winds which characterize the area. It was expected that this would have recognizable effects on stone circle configurations as a result of variations in construction techniques. Examination of summary information in this regard indicated no consistent elongation of the east-west axis of rings, to reflect the prevailing west winds. Although weights were not taken, rock counts did not suggest increased weighting of the upwind (i.e., westerly) ring segment; in fact, the opposite is more common.

Other structural features which might allow interpretation of activity structuring at ring sites were also noticeably absent. There were no definite doorways, no double courses of stone, no internal or external hearths at the stone circle sites examined in the region. While the lack of internal hearths is frequently seen as an indication of warm season occupations, no supportive evidence of seasonality was observed, although the exposed locations of these sites could be taken as indicative of a warm season occupation. This evidence is obviously not sufficient to suggest modification to the "general" winter occupation of the area proposed by Driver's (1978) herd-hunter model. It is believed, however, that final analysis of the data generated by this and subsequent studies will reveal a variety of seasonal use patterns.

The second basic configuration of site type is represented by buried and surficial cultural material. Several sites of this nature were tested in the eastern portion of the study area. Site characteristics varied considerably, and represented base camp, workshop, hunting-processing camp and possible kill site deposits. Four of the six sites investigated in 1984 exhibited deeply buried cultural materials, a factor which will have great significance for subsequent studies. However, other factors common to these sites tend to diminish their significance. These include indistinct stratification of deposits, generally sparse recoveries of artifacts (particularly time diagnostic specimens), poor preservation of faunal materials and soil matrices which are exceedingly difficult to excavate.

Several site specific characteristics mitigate these problems to some degree. The recovery of cultural materials below Mazama Tephra and a number of cultural features at DjPn-47 suggests substantial potential for productive research at that site. The Jensen Springs site (DjPn-90) produced evidence of a pre-Mazama occupation associated with a relatively unusual corner notched point style. The possibility of recovering an analytical data set relating to this important transitional period augments considerably the significance of that site. Although it was not possible to verify the cultural origin of the well separated, well preserved bone beds at DjPn-53, the rarity of the kill site type in the region suggests that additional work may be warranted.

The minimal testing undertaken at both DjPn-112 and 122 was not sufficient to provide an adequate assessment of either site. DjPn-122 appears to represent a small shallowly buried camp of unknown age in an unusual location. Its small size may provide a tight analytical data set relating to a specific aspect of small group seasonal activities. The Entrance Cairns site (DjPn-112) is a unique site possibly relating to ceremonial practices and is of undoubted significance.

The varied sedimentary contexts encountered in test excavations at buried sites have provided indications of locations where future explorative studies might produce significant sites. These include: the bases of terraces where sheltered conditions exist and where later sedimentation rates are high; cliff edges oriented perpendicular to prevailing winds where a good view is available and subsequent aeolian deposition is likely; and prominent bedrock thrusts where structural variations create hollows or saddles suitable as small camping spots and which tend to infill over time.

Examination of aerial photographs of the Burmis-Lundbreck Corridor permits identification of a number of locations throughout the area which meet these criteria. These and a series of other recognizable features will be the subject of investigations in subsequent phases of the project. It is felt that Holocene landscape modification throughout the area has been significant and that many of the gaps in knowledge regarding prehistoric occupation in the region can be related to this factor and its effects on site visibility.

In conclusion, the 1984 program of assessment at known sites within the eastern portion of the Burmis-Lundbreck Corridor met with limited successs in demonstrating a significant research potential at many of the sites examined. Until final analysis of the data is complete and the site sample can be considered representative, substantive statements of significance can not be made. It would appear at first impression, however, that with a single exception, stone feature sites lack the resolution to provide substantial research returns, and that many identified sites of a more generalized nature do not warrant further studies. Many buried sites also lack the resolution to be considered of great significance, but several do exhibit potential to further the understanding of certain aspects of prehistoric occupation of the area. These facts, together with the identification of potentially significant sedimentary contexts for site burial, constitute the most positive aspects of the 1984 program.

THE BLOOD TRIBE HISTORIC SITES DEVELOPMENT PROJECT, 1984

By

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Department of Archaeology
Simon Fraser University

and

Ester Tailfeathers

Economic Development
Blood Tribe Administration

INTRODUCTION

The Blood Tribe Historic Sites Development Project, initiated in the summer of 1984, has two overall objectives, one developmental and the other educational. The developmental aspect includes the recovery of ethnographic and archaeological data and the assessment of these data with regard to their suitability for public interpretation and recreational purposes. While such development will pose some negative impacts to these resources, it will also provide a forum in which the results of this study can be presented within an interpretive framework.

The primary educational objective is to compile an oral history of the Kainai through interviews with tribal elders. In addition, information was gathered regarding historical patterns of land use (especially concerning the northeastern part of the Reserve which was the focus of this year's fieldwork) and traditional methods of processing food resources and manufacturing stone tools. This information will provide future generations with a record of their heritage.

A secondary educational objective concerns the instruction of project members in archaeological field methods and in aspects of regional prehistory. Although the Blood Reserve lies within a segment of Alberta that has a rich and varied archaeological record, very little archaeological research has been undertaken within the Reserve boundaries. It is hoped that by demonstrating the importance of archaeological data, and the need to properly record these data, more sites will be protected until they can be properly investigated.

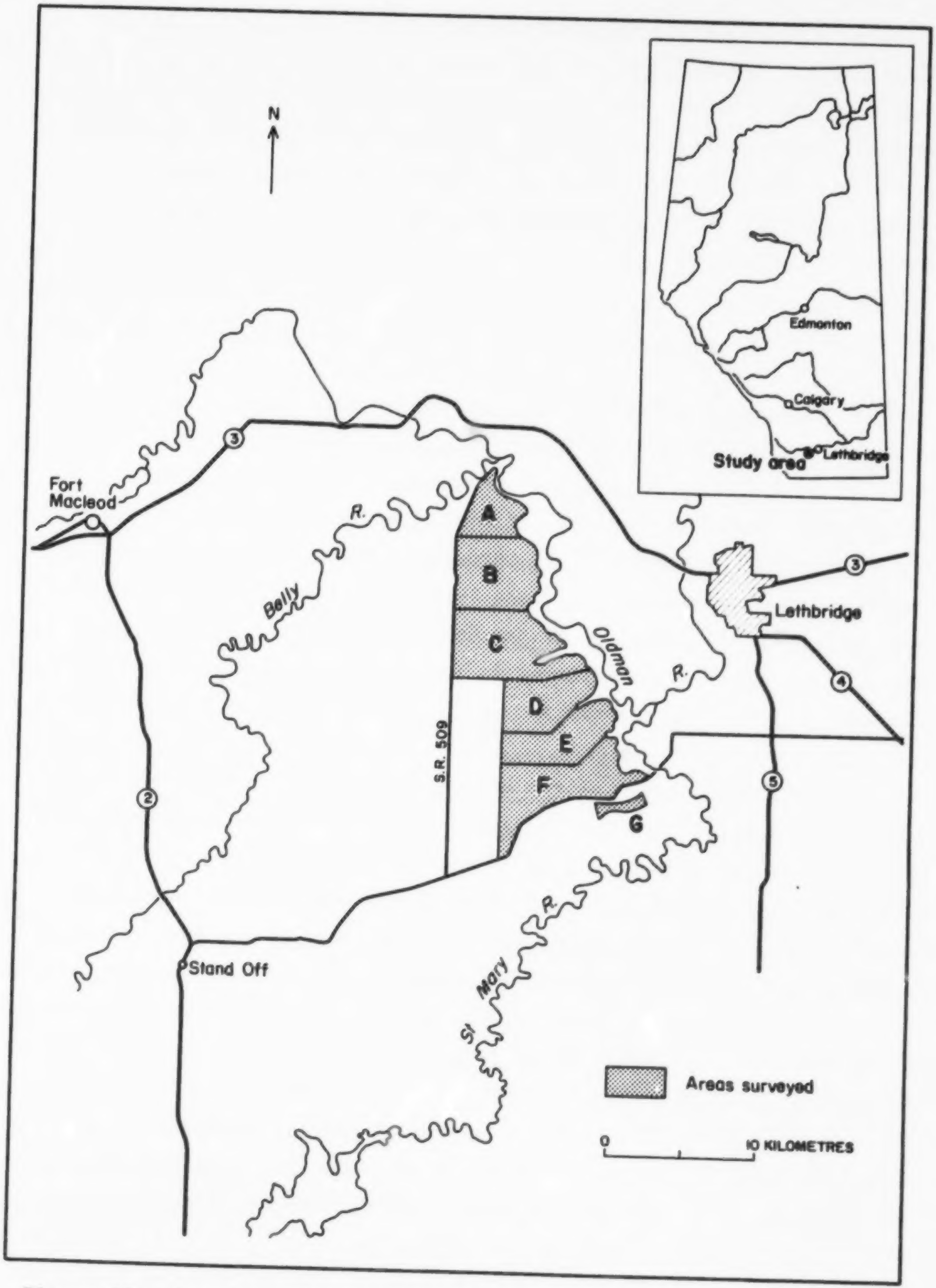
The archaeological aspect of this project also provides a significant time depth to the heritage of the Kainai. The exposure of the project members, and eventually of other Kainai, to the archaeological data will increase awareness of their culture history. The availability of the ethnographic and archaeological information to people beyond the Reserve will also serve to increase general awareness of the Kainai culture. This paper summarizes the archaeological aspect of the Blood Tribe Historic Sites Development Project.

SETTING

The Blood Reserve, situated in the southwest corner of Alberta, is bounded on three sides by rivers: the Belly River defines the western and northwestern limits; the Oldman River lies on the northeastern extremity; and the St. Mary's River flows along the eastern boundary (Figure 38). This portion of the province lies within the western Plains physiographic region. Its geology has been discussed by Dawson (1885), Dowling (1917), Williams and Dyer (1930), Russell and Landes (1940), Stalker (1963), Geiger (1965), and Beatty (1972). The bedrock is formed of poorly consolidated Cretaceous formations, and differences in permeability between these deposits often result in large block slumping and badland topography in the river valleys. The surficial deposits are primarily of glacial origin. Extensive deposits of till (derived from the Rocky Mountains) are covered with silt and clay lacustrine deposits. In general, the topography is gently rolling and the major relief is provided by the river valleys and coulees.

The vegetation of this area is included within the mixed grassland ecozone (Sharp 1972). Speargrass, blue gramma grass, crested wheat grass, western wheat grass, and June grass are the dominant species. Woody vegetation is rare and is largely confined to the coulees and river bottoms. Coulee vegetation is dominated by shrubs, including low growing roses, buckbrush, wolfwillow, saskatoon, chokecherry and willow. While trees are rare in the coulees, copses of aspen and relic stands of balsam poplar are common in the river valleys.

The faunal resources of the area include few species of fish, reptiles and amphibians. Approximately 140 species of birds have been


N
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S.R. 509
Stand Off
St. Mary R.
Edmonton
Calgary
Study area
Lethbridge
Areas surveyed
0
10 KILOMETRES

Figure 38. Areas examined on the Blood Indian Reserve.

observed, 19 of which are seasonal migrants. Important mammalian species include coyote, red fox, weasel, and badger, all of which are most abundant in the coulees. The area within the Reserve is rated as posing moderately severe limitations on ungulates due to the adverse topography and aridity. However, mule deer, white-tailed deer and pronghorn antelope do occur. Bison would have been present in prehistoric and early historic times.

PREVIOUS RESEARCH

There has been relatively little archaeological research undertaken on most of the Blood Reserve. The initial sites were recorded in the late 1950s by R.G. Forbis as a part of the more extensive Glenbow Archaeological Survey of portions of southern Alberta. Although other sites were intermittently reported throughout the 1960s, no extensive inventories were undertaken until the 1970s. In 1972, an archaeological survey of the southern portion of the Belly River was directed by B.O.K. Reeves (Quigg 1974:1). This survey included only a small portion of the southeast corner of the Reserve and is outside of the area examined in the present study.

A more extensive survey of the archaeological resources on parts of the Reserve was undertaken by J.M. Quigg in 1975 as a part of the Oldman River Basin Reservoir Study (Quigg 1975a). This project focused on specific areas potentially threatened by the proposed construction of dams and reservoirs in the Oldman River basin. Within the Reserve, these included an area along the Belly River immediately upstream from its confluence with the Oldman River, and an area along the Oldman River upstream from its confluence with the St. Mary's River. As a result of that project, 31 sites were discovered, including tipi ring camps, cairns, surface sites, buried sites, and bison kills. While the limited nature of the project precluded intensive examination of these sites, Quigg (1975a:4) observed that the areas examined contain considerable amounts of significant archaeological data.

More recently, developments such as highway construction and the erection of power transmission lines have resulted in more research on the Reserve. These projects, which have all been restricted in their areal extent, confirm that a large number of archaeological sites occur within the northeastern portion of the Blood Reserve.

METHODOLOGY

This study was focused on the northeastern portion of the Reserve. The inventory of archaeological sites was accomplished through a judgemental pedestrian survey. That is, we drove to areas where we knew or suspected that sites occurred. We traversed these locales on foot, recording features and collecting samples of artifacts. The discovery of sites was greatly enhanced by discussions with tribal elders; their knowledge of site locations proved invaluable. One elder, John Tallow, was especially helpful in locating sites in the field and in relating information about various sites and features.

The collection of artifacts reflects an attempt to retrieve items which are representative of the range of lithic material types present at various sites. Samples were only collected from sites in ploughed fields where surface scatters were evident. Thus, in addition to artifacts such as scrapers, projectile points, and cobble cores/choppers, a sample of debitage was also retrieved. These collections are not assumed to be representative of the items at any one site and more systematically collected samples will, undoubtedly, somewhat alter the results presented here. Thus, the proportions of artifact types and lithic material varieties recovered from any site must be interpreted with caution.

The intensity with which sites were examined varied with the size of the crew. In the course of the project, the crew included as few as two individuals and as many as six. Larger crew sizes permitted a more extensive and intensive examination of the site areas. As a result, a greater number of stone features (circles, cairns, alignments) may have been recorded at sites visited by a large crew. However, it is doubtful if any sites were not discovered as a result of variations in the number of personnel. Furthermore, the areal extent of the sites was probably evaluated with equal accuracy by either large or small crews.

The survey was focused along the prairie edge above the river bottoms and coulees, but other areas were also examined. These include areas of local topographic relief, such as the heads of coulees and the borders of intermittent sloughs. In addition, cultural material (especially fire broken rock) was occasionally observed along the car tracks running from gravel access roads to the prairie edge. In these instances, the area surrounding the scatter was examined to determine the nature and extent of the site.

Valley bottoms and coulees were also examined. However, by the time that the project began (in late July), much of these areas was covered with dense vegetation. Any surface exposures would have been hidden from view. Furthermore, a preponderance of rattlesnakes in these areas discouraged an intensive examination.

The archaeological and ethnographic aspects of the project were integrated through regular meetings of the groups involved with each component. It was at these meetings that the archaeological crew would present their recent findings and suggest inquiries to be made that would enhance understanding of the archaeological data. The ethnographic researchers would present their findings from discussions about sites discovered earlier and questions which had been put forth at previous meetings. In addition, they would relate stories and identify locations of sites which had not yet been recorded. Through these discussions, each aspect of the project provided direction and feedback for the other. In addition, it was found that through these exchanges the goals of the project were continually focused on recovering that information which is important to the Kainai.

RESULTS

The 65 sites that were encountered have been classified into ten categories: stone circles, cairns, cairns and circles, surface scatters, buried sites, drive lanes, boiling pits (?), historic sites, historic grave sites, and complex feature sites. Stone circles consist of rings of cobbles varying from about 2 to 4 m in diameter. While these are frequently interpreted as tipi rings, their function is not always easily discernable (but see Finnigan 1982). Cairns are piles of stones and vary in size from two or three to as many as 20 or more cobbles. The presence of lichen and the depth of burial of the stones differentiate ancient cairns from those constructed during more recent land clearing activities. Circle and cairn sites contain both stone circles and cairns.

Surface scatters include sites where artifacts were observed and collected from the surface, but no buried material and no stone features (i.e., rings or cairns) were noted. These sites vary in size from a few metres to over 100 m in extent. In contrast, buried sites are those where cultural or faunal material was observed below the ground surface. Exposures of these sites were most notable along river banks, coulee edges, and in badger and gopher burrows.

Drive lanes consist of extensive, parallel lines of cairns or single rocks. These extend for various distances and generally terminate at a steep precipice or lead into coulees.

Boiling pits (?) are identified as small, circular depressions (ca. 1 m in diameter) ringed by medium sized stones (ca. 60 cm in diameter). The suggested function of these features is, at present, speculation.

Historic sites are those sites where materials of European, Euro-American, and/or Euro-Canadian origin were found. Most often, these are the remains of wooden buildings and their associated features. Historic grave sites include depressions measuring ca. 1 m by 2 m and are frequently accompanied by piles of stones. These were identified as graves by informants. In many instances, these features were covered with a thick growth of shrubs.

The final site type, complex feature sites, includes those locations where a combination of features occurs. For example, in some cases, stone circles, cairns, and drive lanes were all found in close proximity. Rather than designating three separate sites, all were combined within a single, complex feature site.

SITE DISTRIBUTION

The study area can be divided into seven smaller areas, separated by distinctive geographic features (Figure 38). These divisions are accessible by different routes and may be considered as individual management units for the purposes of future historic sites development. The numbers and types of archaeological sites discovered in each area are presented in Table 13. This table does not include sites which were recorded prior to the present study.

A number of considerations must be borne in mind when examining these data. First, the areas are not all of equal size. The number and variety of sites occurring in each area may be a function of its size; the large territories may be expected to contain more sites as well as a greater variety of site types (given an even distribution of resources). Second, the amount of cultivated land in each area will affect the number and types of site recorded. As access to cultivated fields was restricted, areas with a large proportion of land in crop were examined

Table 13. Occurrence of site types by area.

Site Type	Area							
	A	B	C	D	E	F	G	Total
Stone circles	4	4	2	-	2	-	2	14
Cairns	2	2	1	-	-	-	1	6
Circles and cairns	3	4	2	-	-	1	3	13
Surface scatters	4	1	1	1	3	4	2	16
Buried sites	2	-	-	-	-	-	-	2
Drive lanes	1	-	-	-	-	-	-	1
Boiling pits	-	-	-	-	-	-	1	1
Historic sites	1	-	-	-	-	-	-	1
Historic graves	2	-	-	-	-	-	-	2
Complex feature sites	2	2	-	1	1	2	1	9
TOTAL	21	13	6	2	6	7	10	65

less intensively. On the other hand, surface scatters were most often discovered in ploughed fields. Other site types are likely to have been disturbed by the cultivators and may, therefore, not be visible.

Comparison of the numbers of sites by area indicates that Area A contains, by far, the largest number of sites. Furthermore, this area also includes the widest range of site types. Areas B, C and G can be ranked second, both in terms of the number of sites present and the range of site types recorded. Of the remaining three areas, Area D is distinguished by relatively few sites. It must be emphasized, however, that this area is much smaller that the others and is largely cultivated. Furthermore, one of the two sites is very large and contains a previously unrecorded medicine wheel. This underscores the importance of all areas with regard to the presence of significant historical resources.

DISTRIBUTION OF LITHIC MATERIAL TYPES

The lithic material types collected from various sites were identified by visual inspection. Unfortunately, there was no access to a comprehensive reference collection. As a result, more detailed identification of lithic types (such as specifying source locations) is beyond the scope of this analysis. The data presented here serve only to illustrate the range of material used in the manufacture of stone tools.

The distribution of lithic material types in the sites which were surface collected is summarized in Table 14. It is apparent from these data that some forms of lithic material were recovered more frequently than others. Green silicified siltstone, white chert, and quartzite occur in almost every collection, while black chert, chalcedony and quartz are less common. The other lithic types occur in varying frequencies. While these trends are suggestive, it is important to remember that the collection strategies were quite unsystematic. It is, therefore, difficult to assess the amount of judgemental bias reflected in these collections. Furthermore, as Table 14 illustrates and as a Spearman rank-order correlation coefficient (Siegel 1956) confirms ($r_s = 0.74$; $p < 0.001$), the variety of lithic materials in the assemblages is correlated with the number of items in those assemblages. That is, as

Table 14. Occurrence of lithic material types in surface collected sites (N=30).

Material Type	Number of Sites
green silicified siltstone	18
purple silicified siltstone	6
black chert	9
red chert	4
fossiliferous chert	1
white chert	15
Knife River Flint	7
tan chert	7
petrified wood	2
quartz	10
quartzite	22
limestone	3
micaceous schist	2
sandstone	2
granite	1
siltstone	2
obsidian	1

more items were collected, more varieties of lithic materials were recovered (Table 15).

The examination of lithic material types does reveal two important points. First, green silicified siltstone and quartzite occur in the majority of assemblages. This is true even when the collecting biases are considered. Both of these materials are locally available in the gravel deposits exposed in the river valleys. Second, some exotic materials are present. These include one piece of obsidian and some chalcedony which may have been obtained from the Knife River area of North Dakota. Thus, while local material was used most extensively, it is apparent that some exotic materials were also being procured. This is similar to the pattern of lithic material utilization at the Cactus Flower site (Brumley 1975:72). Unfortunately, the nature of the collections does not indicate if these exotic materials were being formed into only certain classes of tools.

ARCHAEOLOGICAL AND ETHNOGRAPHIC INTEGRATION

When archaeological and ethnographic fieldwork are combined, the objective is most often directed at deriving behavioral correlates of past human actions (e.g., Watson 1979; Yellen 1977; Gould 1980). These correlates are then used to arrive at a greater understanding of the adaptive strategies and processes of past societies.

Such has not been the case in the present study. Rather, the archaeological and ethnographic components of the study often collected information concerning very different aspects of the Kainai heritage. At times, however, the information gathered by one component proved invaluable to the other and initiated different directions in the research. These dynamics are best illustrated through example. The four sites discussed below illustrate how this exchange of archaeological and ethnographic data enriched the project.

Site DkPg-24 is located near the confluence of the Belly and Oldman rivers. First reported in 1975 (Quigg 1975a), it consists of several layers of bison bone eroding from a cut bank (Figure 39). A large coulee terminates about 20 m south of the bone bed exposure and may have served as a natural drive channel (Figure 40). The examination of the site in

Table 15. Quantities of cultural items and lithic material types by site.

Site	No. of Items	No. of Lithic Types
DkPg-1	9	3
DkPg-24	16	4
DkPg-32	5	2
DkPg-38	2	2
DkPg-40	88	11
DkPg-41	1	1
DkPg-43	2	1
DkPg-44	2	2
DkPg-45	2	1
DkPg-46	62	10
DkPg-47	7	4
DjPf-17	12	2
DjPf-23	58	7
DjPf-94	33	5
DjPf-95	1	1
DjPf-96	9	6
DjPf-98	23	7
DjPf-100	4	3
DjPf-101	3	3
DjPf-104	15	6
DjPf-106	4	3
DjPf-107	23	5
DjPf-108	1	1
DjPf-109	6	4
DjPf-110	6	2
DjPf-111	11	2
DjPg-5	7	4
DjPg-6	11	3
DjPg-7	21	6
DkPf-84	1	1

Figure 39. Site DkPg-24, view to the south.

the summer of 1984 revealed that unauthorized excavation had led to the collapse of a large block of the exposed material. On closer examination, it was discovered that much of the bison bone was intact and that pottery occurred in association with the bones. Many of the Kainai involved with the project were unaware that pottery existed on the Plains prior to contact. The discovery of a large sherd (thick plain, after Byrne 1973) led to further discussions with tribal elders concerning the process of ceramic manufacture. They reported that a friable schistose rock was ground and used as temper with the clay derived from local river-side deposits. The mixture was then molded into a small hole dug into the ground. Willow branches, fashioned into circles, were placed along the top of the vessel and covered with additional clay. In some

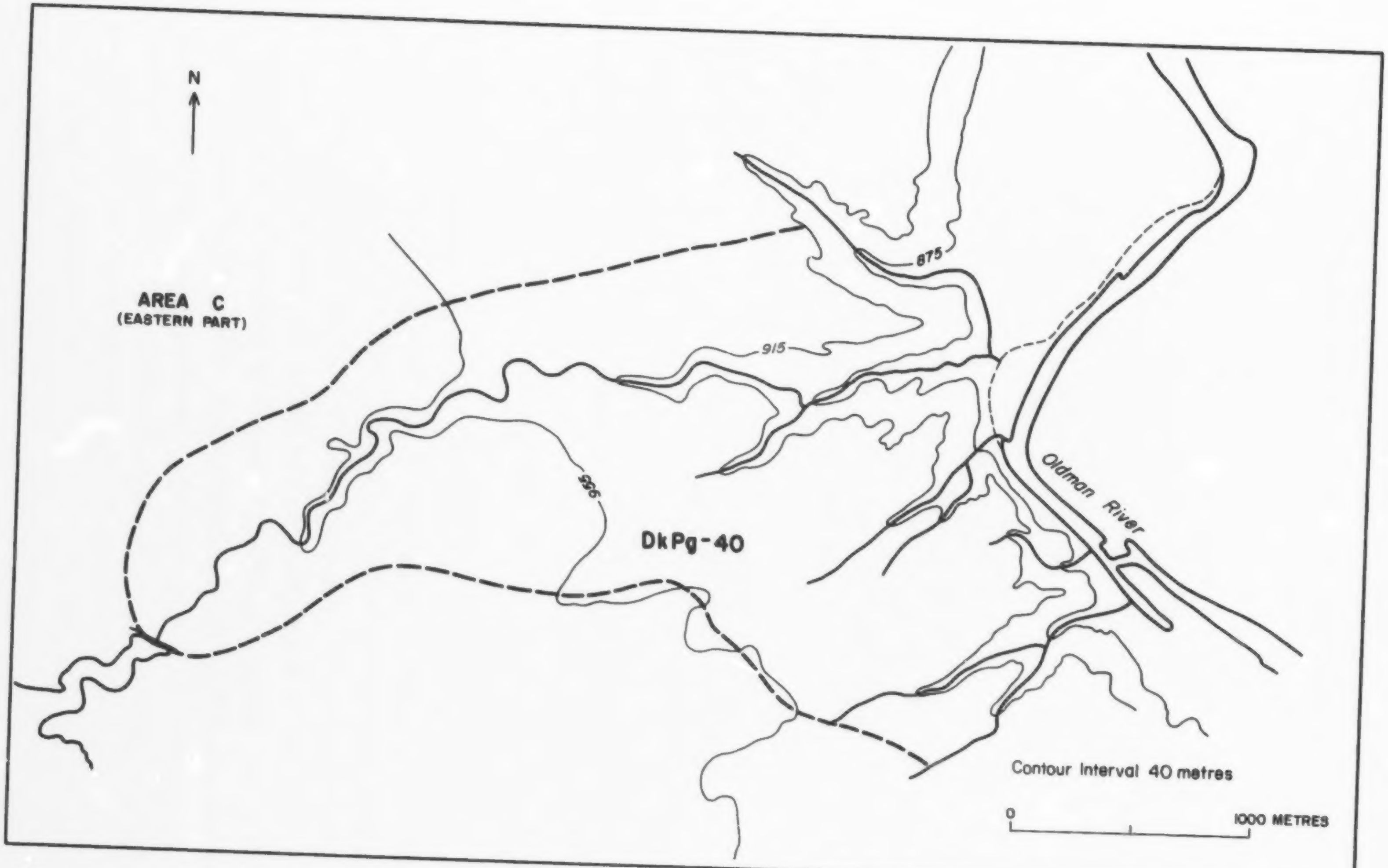
Figure 40. Site DkPg-24, view north, down Yellow Bone Coulee.

instances, a handle was formed by bending a willow branch into a semi-circle and attaching it to the willow-backed rim. The ceramics were dried within the mold. No information was available regarding the firing of the ceramics or of methods and significance of decorations. In addition, the interest generated by this site led a number of elders to relate stories about past activities undertaken in this area. Of special interest was the use of the coulee (known as Yellow Bone Coulee) as a burial ground during the influenza epidemic in the early years of the twentieth century. Unfortunately, time constraints prohibited a detailed survey of the coulee and no human remains were observed.

Perhaps the most dramatic example of the interplay of ethnographic and archaeological information is provided by Conrad's Post. This late nineteenth century whiskey trading post lies immediately adjacent to the right-of-way of Secondary Road 509. Attention was brought to it by Lifeways of Canada Ltd. as they undertook a heritage resource impact assessment in conjunction with the road construction. The interest generated by the Kainai resulted in the initiation of the present project. While no archaeological excavations were undertaken at the site, a considerable amount of oral history was recovered concerning Kainai relationships with the traders and the effects of the whiskey trade on Kainai culture. It is of special importance that this history reflects the Kainai perspective of culture contact in the late nineteenth century. This information should prove invaluable in the interpretation of the site and the local history of this period.

Site DkPg-40 extends along both sides of Snake Coulee (Figure 41). Over 200 stone circles were encountered and varieties of artifacts were collected from the surface. Unfortunately, most of the site was cultivated and, although many circles and cairns could still be identified, detailed information has been lost. The significance of the site was greatly enhanced, however, when elders informed us that one of the circles had been the site of Far-Looking's tipi (a Kainai chief). One elder (Morris Crow) even identified the specific circle (Figure 42). At the time of the present study, little was known about Far-Looking or about the circumstances under which such a large encampment was formed. It is hoped that future interviews will provide more information regarding these matters.

Finally, site DjPf-23 is the location of a medicine wheel (Figure 43). Although previously unrecorded by archaeologists, the structure is well known to many elders. They informed us that the monument was constructed in honour of Nitapinaw, a Kainai warrior, and that the central cairn with radiating spokes indicates that this was the place where Nitapinaw died or is buried. The nearby presence of many stone circles and a number of cairns suggests that an important event may have taken place at this site. We hope that continued interviews with tribal elders will bring forth more information.


N
AREA C
(EASTERN PART)
875
915
955
DkPg-40
Oldman River
Contour Interval 40 metres
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1000 METRES

Figure 41. Site DkPg-40 at Snake Coulee.

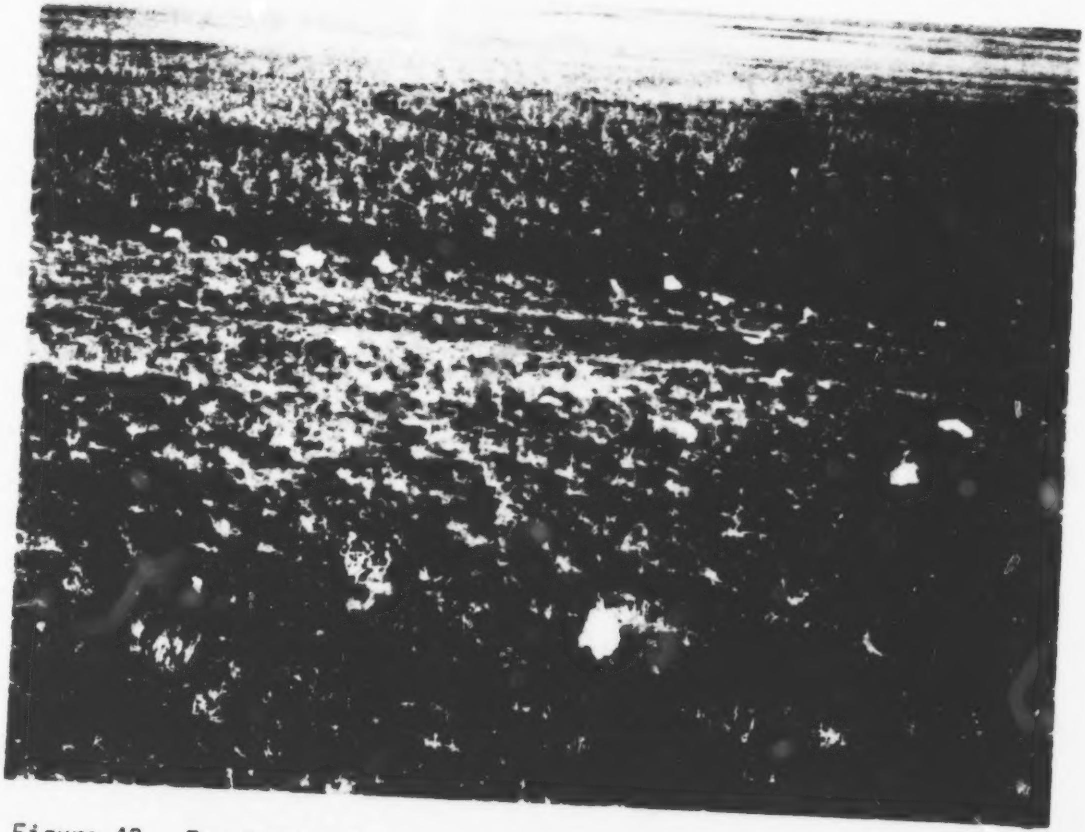

Figure 42. Far-looking's tipi ring.

DISCUSSION

We believe that the Blood Tribe Historic Sites Development Project has attained the objectives outlined earlier. The project stimulated the interest of a large number of Kainai and increased awareness of the variety and importance of the archaeological resources on the Reserve. The information provided by tribal elders has proven invaluable in the interpretation of some archaeological remains. In addition, aspects of Kainai history and culture that have been recovered through interviews with elders are now available to the Kainai.

An evaluation of the developmental aspect of this project must await a more detailed formulation of the development plans. The sites

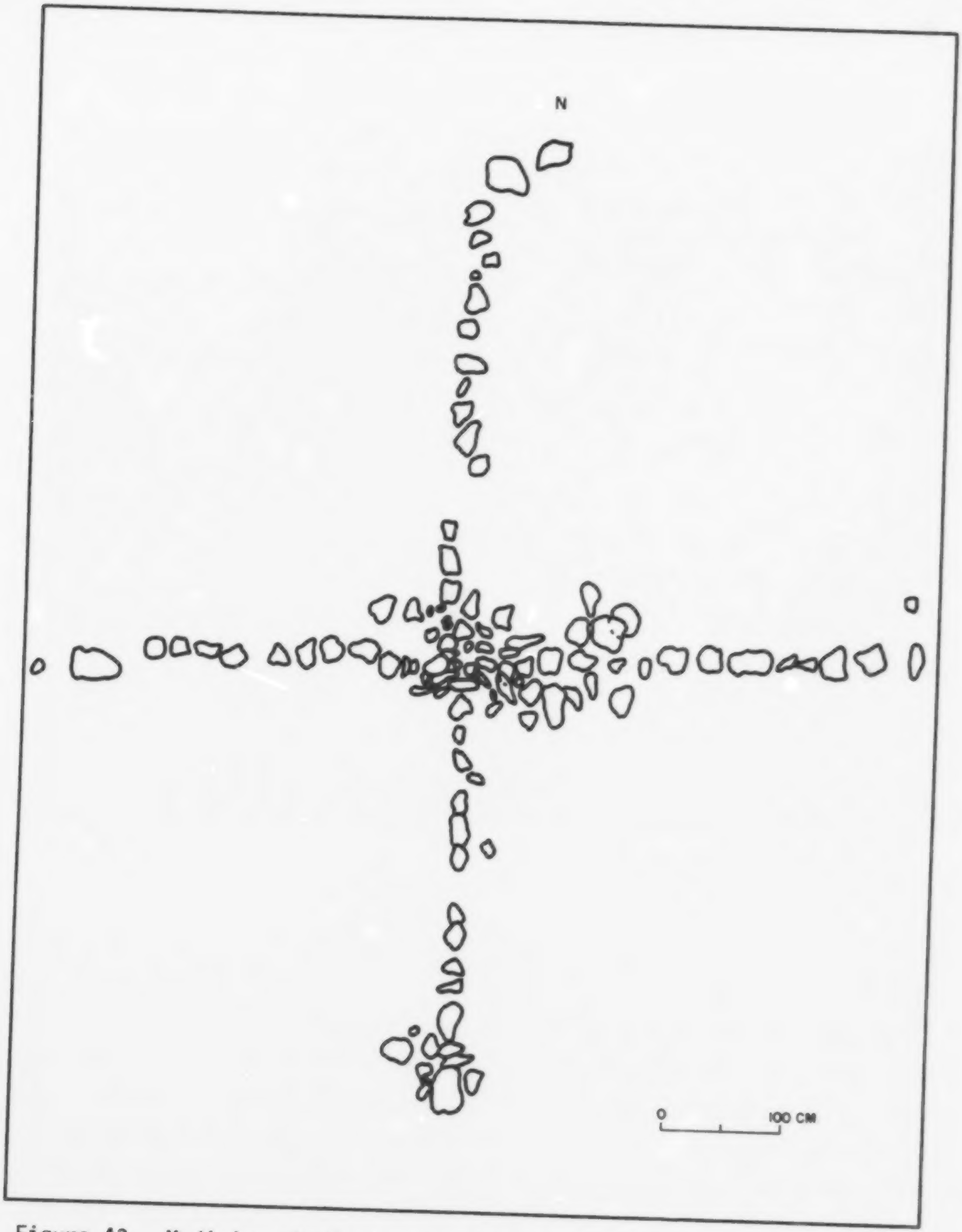

Figure 43. Medicine wheel at site DjPf-23.

discovered reflect a wide range of activity loci and may be easily incorporated within an interpretive framework. Unfortunately, age can be assigned to only a few sites. Any future development plan will have to incorporate a more detailed study.

This project has provided a rare opportunity to undertake ethnographic and archaeological research directed toward providing information necessary for the preservation of the Kainai heritage. It is hoped that future research will continue to expand upon this information.

ACKNOWLEDGEMENTS

We wish to thank the Archaeological Survey of Alberta (A.S.A.), the Archaeological Survey of Canada (A.S.C.) and the Blood Tribe Administration for their support and interest. Dr. David Burley, Head of the Research Section, A.S.A., Mr. Jacques Cinq-Mars, Chairman of the Rescue Archaeology Programme, A.S.C., and Ms. Gerri Ehli of the Blood Tribe Administration helped immensely.

The knowledge and assistance of Katie Wells and John Tallow enriched the project and ensured its success. To them, and to the other elders who helped us, we owe a special debt of thanks.

PERSPECTIVES ON RESEARCH: A VIEW FROM THE OFFICE OF A BUREAUCRATIC ARCHAEOLOGIST

By
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INTRODUCTION

A plea for explicit research design in the context of archaeological investigation is neither a recent topic for discussion (e.g., Binford 1964; Vivian 1977, among others) nor one solely restricted to Alberta archaeology. The importance of research designs in archaeology, nevertheless, makes it an ever recurrent focus for review and exposition. In the current scenario of Alberta archaeology, which has been dominated by a cultural resource management, contract-based programme over the past decade, it is even more the case. Reflection on the archaeology of this decade (see, for example, Spurling 1981, 1982; Brink 1982; Donahue 1982a), its failures and its accomplishments, only too clearly emphasizes the necessity of well developed and implemented research designs (but see Reeves 1982).

Despite the above categorical statements, the Alberta archaeological community, in general, has yet to embrace the idea of preformulated research designs with explicit problem orientation. In some cases, it seems that some individuals simply do not understand what a research design is; most commonly, it is confused with research proposal which almost always is equated with contract terms of reference. Others place the onus of research design construction and the consequences of its absence squarely of the shoulders of the Archaeological Survey of Alberta. Finally, there are the majority, who view the private consultant's role in the ongoing affairs of resource management in Alberta simply as contracted data collectors who are gathering something from the past to preserve for the future (Reeves [1982:17] labels this the antiquarian attitude). No matter what the reason, I contend that archaeology in Alberta has suffered, and that the tremendous increase in applied funds since the introduction of heritage legislation has not resulted in equivalent knowledge returns.

Being one of those "government bureaucratic archaeologists", as J.V. Wright (1982) has recently labelled us, I believe it to be my responsibility to provide direction in the conduct of archaeology within Alberta. Given the implications of the views of a "bureaucratic archaeologist", I believe the archaeological community must provide the courtesy of an audience. This paper focuses on what I believe to be a major problem in Alberta archaeology, the need for explicitly formulated research frameworks. The nature and implications of such research designs in the spectrum of archaeological research and resource management activities within Alberta are reviewed.

RESEARCH - WHAT IS IT?

The importance of defining provincially or regionally oriented research objectives, a step many feel to be a prerequisite to research design formulation in Alberta, has been a matter of concern to the Archaeological Survey of Alberta for several years. As far back as 1979, the Archaeological Survey initiated meetings with the Alberta professional archaeological community to delineate meaningful problems upon which a focus might be placed. A subsequent meeting in 1980, the establishment of a working committee of academics, bureaucratics, and consultants, and a yearly promise by the Survey to finally complete the exercise has failed to produce much of a concrete nature. In late 1984, I was assigned the explicit task of formulating a series of "realistic" province-wide goals that would both further our knowledge of Alberta's past and assist in the Survey's efforts to meaningfully manage the province's cultural resource base. At the time of this writing, I continue to work on these goals.

In preparing myself to tackle such a task, the logical beginning involved the following steps: 1) review the necessity for a definition of province-wide research objectives; 2) review what has been accomplished to date; 3) consult with the professional community in general on what they believe to be significant areas of concern; and, 4) draft a research plan for discussion purposes. I, of course, was under the assumption that all parties agreed (even if it was a matter of compliance) that research problems, explicit research designs and structured field programmes were necessities. I also thought that most professionals in Alberta agreed on what constituted research. I discovered that this, unfortunately, is not the case.

By way of introduction to the problems stated above, I believe we can turn to the 14th Annual Chacmool Conference sponsored by the Archaeological Association of the University of Calgary in 1981. This conference focused upon "Directions in Archaeology" with the subtitle, "A Question of Goals". The principal issues were cultural resource management oriented. Of the many symposia, one of the most lively concerned the "Role of Research in Contract Archaeology", organized by the Director of the Archaeological Survey of Alberta, P. Donahue, and later published in the conference proceedings (Francis and Poplin 1982). Below the belt blows aside, consultants, academics and bureaucratic archaeologists let their hair down and told it as it was, or at least as they believed it to be.

B.O.K. Reeves (1982), the sole Alberta academic involved in the session, played the protagonist. Because Reeves also is the president of one of Alberta's largest historical resources consulting firms, his views on the matter of research, what it is, and its role within contract archaeology, must be taken with additional seriousness. To his credit, Reeves did not circumscribe the issue; his paper provided personal views on the archaeology of the 20th century and pointedly addressed the question of "Research - What Is It" (ibid.:16-19). As will become apparent, Reeves chose a perspective which evokes debate and serves nicely to introduce the question of research design. It is emphasized once again that the issues involved are not limited to provincial boundaries but are the centre of archaeological controversy in many areas of North America (see Hill 1972; King 1977; Gumerman 1977; Goodyear et al. 1978).

Reeves begins his discussion on the question of research with the following introduction:

> There is much acrimonious debate in the profession today over research. Conservation archaeology -- the role of research in it -- is there any? If so, what is it? Who pays for it?
>
> These issues, I contend, are mostly non-issues, reflecting in large measure philosophical attitudes as to what constitutes research, i.e., it must be problem-oriented, hypothetical (sic) - deductive vs. inductive, etc., all fine academic "buzz-words" the Binfordian school has burdened us with.
>
> On the opposite pole to the problem-oriented group is the "antiquarian" view which influences this debate and is reinforced by the popular media.... In this view, it is the collecting of things which is the focal activity.
>
> The Binfordian -- "you gotta have a research design" -- and antiquarian attitudes are, I suggest, largely responsible for the acrimonious debate on research vs. non-research in conservation archaeology (1982:16-17).

With opposite poles defined, Reeves goes on to claim a middle of the road position--he does the fieldwork and lets the collected data define the research parameters. He also provides what he feels to be a list of credits for this approach to conservation archaeology within Alberta over the eighteen years of his practise (ibid.:19-21). The merits of many of these are beyond dispute.

Notwithstanding such contributions, here I take issue with two of Reeves' philosophical positions. First, the claim that the debate over research in conservation archaeology is more apparent than real certainly side-steps one of the major issues in the growth of a cultural resource management philosophy in North America, in general, and Alberta, in particular. For example, we are still grappling with the question of whether or not a development proponent should be expected to pay for "research" and, if so, where should the limits be defined? A variety of other issues, including that of research competency, also may be cited as integral components to the debate.

Secondly, and of more importance to the question of research design, is Reeves' explicit categorization of the hypothetico-deductive (hereafter deductive) and inductive approaches to archaeological investigations as nothing more than Binfordian "buzz words". Again he would have us believe that this is nothing more than obfuscation in the halls of academe. Quite obviously, this stance ignores the long standing theoretical debate on research processes in American archaeology (e.g., Taylor 1948; Watson, LeBlanc and Redman 1971, among numerous others) and overlooks some of the most basic elements within a philosophy of science. While I believe Reeves may have overstated his case in the protagonist role, I am certain he would have little difficulty casting me in the light of a "Binfordian baby" (Reeves 1985) for my position on explicit research design formulation.

The real issue is not who is right or wrong, but which course should be followed and, perhaps, legislated in our pursuit of knowledge of Alberta's past. I contend that among the professional archaeological community, as it exists today, there can be no middle road; either one holds to a deductive approach to scientific reasoning or follows the inductive philosophical position of archaeological investigation. Antiquarianism, in its truest form, is against the law within Alberta. Reeves (1982) uses it in the partial context of an inductive strategy employed by a number of archaeological consultants; Brink (1982), presenting a paper in the same symposium, feels such a strategy also should be against the law.

The inductive approach to archaeology is empiricist in nature and holds to the philosphical position that synthesis and interpretation will naturally flow once a worthwhile body of data has been gathered (King 1977:89). Since these data will define which problems will be eventually addressed, all data will have meaning and must be gathered without bias. Hempel (1966:11) provides the sequence of inductive research procedures as: 1) observation and recording of all facts; 2) analysis and classification of these facts; 3) inductive derivation of generalizations from the facts; and, 4) further testing of the generalizations. Hill (1972:67) translates this into the familiar archaeological strategy of: 1) excavation; 2) classification and dating; 3) analysis; and, 4) interpretation (also see Swartz 1967). As Hill notes, this strategy "permits (and even encourages) researchers to go into the field without specific problems or hypothesis in mind; there is little guidance in terms of selecting relevant data" (1972:67).

A deductive strategy in scientific investigation, as defined by King (1977:89), is an approach which seeks to explain regularities and discontinuities in the archaeological record. The archaeologist identifies the problem(s) to be solved, develops hypotheses to bridge the gap between the problem and data to be collected, derives test implications for the hypothesis(es), and delineates and carries through the appropriate fieldwork to verify or reject the hypothesis(es) in question (ibid.; see also Hempel 1966; Fritz and Plog 1970). Here, it is important to emphasize that fieldwork is an explicitly defined methodology to test some hypothetical proposition. It is undertaken only after that proposition has been defined. Fieldwork focuses on the retrieval of a specific set of data relevant to the problem solution and, thus, is extremely biased in an inductivist philosophy. Inductive generalization frequently may form the basis upon which problems are defined or, alternatively, deductive analysis may lead to inductive generalization (see Hill 1972; Fritz and Plog 1970; King 1977 for a full discussion of this interplay). A full deductive approach, nevertheless, holds to a totally independent and varied series of organizing principles and strategies.

The fallacy of the inductivist philosophy with regard to totally unbiased data collection in archaeology has been well documented in the literature (see Hill 1972; King 1977) and need be addressed only briefly. In archaeology, this philosophy translates into the general argument that one must not go into the field with preconceived notions and that field techniques must be as exact as possible to collect every piece of data no matter how irrelevant it appears to be. The contraposition to this argument follows that the nature of archaeological data does not allow for complete collection and unbiased samples. Aside from the extreme difficulties one would encounter if an attempt were made to recover a one hundred percent sample, most frequently, one must sacrifice one type of data in archaeology to gather another. Thus, archaeological data must always be considered a sample of the total data set potentially available for collection. Since we are dealing with samples, the archaeologist continuously is making decisions as to which data to collect as opposed to which to ignore. No matter how unbiased (atheoretical) the archaeologist may profess to be, decisions are not made without reference to one's theoretical perspective (Hill 1972:67) or preconditioning based on prior experience. If a "good" archaeologist is one who is defined as having a "metaphysical feel" for the data based upon x number of years of field experience (as implied in Flannery 1982), can we really expect data recovery not to be biased? Here the difference between induction and deduction is that the latter explicitly defines this bias as a research problem to be solved. It also ensures that a majority of the data relevant to the solution of this problem will be collected.

At this point I believe it appropriate to examine an example of an inductive research approach in an Alberta archaeological project. Reeves (1982:20) cites this example as one of the significant research discoveries associated with conservation archaeology. This project consists of two site excavations (Head 1980; Van Dyke and Maltin 1980) which produced the answer to a presumably long standing research question --"Did the Blackfoot Eat Fish?" The crux of this discovery, as described by Reeves, is as follows:

> Historical records and oral tradition indicate the Blackfoot did not eat fish and, until 1980, the fact that fish bones had not been found in excavated late prehistoric sites in the Alberta plains, tended to substantiate the record.
>
> In 1980, two small isolated projects, involving the excavation of tipi rings--one in a subdivision on the Bow in Calgary and the other on a Calgary Power line near Brooks, 200 km downstream--recovered fish bones, a leister, stone tools, and trade goods, posing more questions than answers at this time (1982:20-21).

The question of whether or not the Blackfoot ate fish was not posed, of course, until after the discovery of fish bone in these sites. Here, the discovered facts have structured the question by providing an answer. That the solution of this problem may be a significant discovery is not being debated. However, given the primacy of the question as implied above, perhaps the question should have been posed first and the appropriate test implications designed to test the hypothesis drawn up. In this case, certain types of sites (including the two above) would be selected as appropriate for testing, and a methodology conducive to discovering fish bone (i.e., column samples, small screen mesh size, etc.) would be employed. The same answer, undoubtedly, would be derived but probably somewhat sooner. One wonders how many other sites with fish bone have been excavated but lacked appropriate methodologies to recognize it, or how much fish bone was missed at Reeves' two sites due to inappropriate retrieval strategies (see Bobrowsky and Ball 1982).

In reporting the discovery of fish-eating Blackfoot, Reeves has suggested that more questions than answers are currently posed. This is excellent! These questions now structure the research design. Hopefully, one of those questions will focus on how you identify a Blackfoot site in the face of massive complexity for historic placement of ethnographic peoples (see Brink 1985; Forbis 1963).

The preceding discussion is not meant to belittle the accomplishments of Reeves in Alberta archaeology. Reeves is both an academic and consultant with his own perspective on the problems to be solved in the prehistory of the province. In fact, several other examples may be cited where he has followed a hypothetico-deductive paradigm whether he wants to call it that or not. Unfortunately, not all archaeologists have such insights into Alberta prehistory. This is demonstrated amply in the reams of descriptive volumes which Reeves (1982), among many others, has labelled a consequence of resource management in Alberta. It is a consequence, however, of an inductive philosophy.

Inductive archaeological research strategies, without the necessity of having a problem orientation, promote the collection of data divorced from the subsequent analysis and report preparation stages. Hill (1972:68) argues, and I believe rightly so, that field oriented individuals may have little involvement with theoretical perspectives, problem solutions and the like. Thus, analysis is relegated to a continuous cycle of detailed description, limited artifact comparisons in space and time, and the placement of a site into some well worn culture historical sequence. That such a description characterizes a majority of the volumes on the library shelves of the Archaeological Survey of Alberta cannot be disputed by those who have read them. R.G. Forbis (1982:160), in assessing the archaeology of the Canadian Plains up to 1980, categorically supports such statements by noting that we have yet to reach beyond 1960 in the Willey and Sabloff (1974) scheme of things; 1960 marked a time when the rest of North America moved into the explanatory period.

So what is research? Research is a quest for knowledge carried out in a systematic and programmatic fashion. In Alberta archaeology, the question should not concern what research is, but how it should be carried out. In that regard, I have a firm conviction in the employment of a deductive approach to finding archaeological problem solutions. Explicit research design formulation is a consequence of that approach.

WHAT IS A RESEARCH DESIGN?

A research design in archaeological investigation is an explicit statement of a project's planning and operational sequence from the definition of research problems to be solved through to the final analytic methodologies. It provides: 1) a rationale for the research problems to be investigated; 2) a hypothetical approach to test those problems; and, 3) a definition of the data and analysis procedures required. Most importantly, it requires the archaeologist to think through a "plan of attack" in a logical fashion and forces the practitioner to provide and scrutinize an explicit list of the assumptions being employed. The results of a project following an explicit research design leave few questions in the mind of the reader as to how conclusions have been derived.

Goodyear (1976, cited in Schiffer and Gumerman 1977:130) lists four advantages of the employment of explicit research designs. These are:

1. If the problems and hypotheses are set forth at the outset of research, the archaeologist is much more likely to specify and gather the relevant data.
2. An explicit research plan allows for public monitoring of research biases.
3. The progress and efficiency of an undertaking is more readily evaluated.
4. Explicit research designs allow for better integration of the conceptual and empirical components of investigation.

To a limited extent, the first of these advantages has been discussed in the previous section's rationale for a deductive methodology. There can be little doubt that once a problem is defined, the data necessary to solve that problem also can be defined and, thus, collected. If the problem is defined after data collection, one risks the possibility of not having data appropriate to the question at hand (Burley 1980). The second and third points have obvious implications both for validating research results and for conservation archaeology (see also McGimsey and

Davis 1977:72). Finally, Goodyear's last advantage is critical for an understanding of the assumptions to be employed in the research and the basis upon which collected data sets are related.

Having defined the general context of a research design, it is notable that several types of designs may be formulated depending on the focus one wishes to pursue (Goodyear et al. 1978). At least three of these are considered to have direct relevance to Alberta archaeology and warrant discussion. These are substantive research designs, methodological research designs and theoretical research designs.

Substantive research designs are characteristic of those projects in which specific questions about a region, cultural group, time period or similar such topics are to be resolved. For example, I return to Reeves' (1982) fish-eating Blackfoot as a type of problem that might be addressed in a substantive research design. Others could be as general as the effects of the Altithermal on Middle Prehistoric subsistence patterns or, perhaps, relate to particular technological strategies of lithic reduction by a defined culture historical group. The possibilities for problem definition are limited only by the researcher's knowledge, interests and imagination. Substantive research problems share a common thematic emphasis by virtue of their study of a cultural system within its defined geographical and historical parameters.

Methodological research designs are those formulated to test the efficiency and/or effectiveness of archaeological methodologies within specified contexts. Alternatively, they also may include controlled experimental studies designed to elucidate factors which potentially lead to more effective methodologies or interpretation. In the case of the former, the most ready to mind example is that of testing the effectiveness and efficiencies of various sampling frameworks (see Mueller 1974 for a case study). In the latter, types of studies which focus on such processes as ploughing and its effects upon archaeological distributions are good examples (see contributions in O'Brien and Lewarch 1981).

Finally, theoretical or topical research designs are broad in nature, addressing general problems of culture process without defined geographic context. The question of why sites are located where they are is a popular example of this form of research framework (e.g., Plog and Hill

1971; Goodyear et al. 1978) and one considered most appropriate to the Alberta context (P. Donahue personal communication 1985). Other examples, such as why human groups organize themselves in space, are commonly cited (Goodyear et al. 1978:167). The crux of a topical/theoretical research design is the fact that it may be preformulated independent of context and may be employed in a wide variety of situations. Goodyear (1977) has developed a comprehensive framework of this nature for use in highway projects in South Carolina and well illustrates its applicability to cultural resource management contexts.

The type of research design to be employed is dependent upon the project, the researcher and the state of prior knowledge about the data to be investigated. In the subsequent discussion, this is brought to light in the specific context of Alberta archaeology.

RESEARCH DESIGN IN ALBERTA ARCHAEOLOGY

Throughout this paper I have implicitly emphasized that studies in Alberta archaeology will provide few new insights into our understanding of the past unless the profession adopts or is legislated to adopt an explicitly deductive approach. Because of the nature of "pure" research programmes and their impact on the resource(s) under investigation, detailed problem definition and appropriate research design formulation currently are required for the issuance of an archaeological research permit. This ensures that the knowledge gain offsets the resource loss as a result of excavation. Thus, it provides an acceptable tradeoff in cultural resource management terms. However, given the varied and frequently limited nature of most archaeological projects conducted under the rubric of a historical resources impact assessment or follow-up investigation, there remains the question of whether or not it is feasible to expect a consultant to produce a research design. To go one step further, we also must address the issue of whether or not a development proponent should be expected to pay for research.

Dealing with the latter, one must first attempt to interpret the intent of the Alberta Historical Resources Act. Certainly few would dispute an underlying conservation ethic that is initially manifest in the discovery and evaluative assessment of archaeological and other historical resource sites that otherwise might be destroyed through unregulated development. This is an explicit recognition of the nonrenewable nature of the resource base and the consequences of its loss to the people of Alberta. The Minister of Alberta Culture has been legislated the authority to require impact assessments by a proponent if reasonable cause exists to indicate the presence of historical resource sites. The Minister also was legislated authority to require conservation measures, again at a development proponent's expense, should significant historical resource sites be found. Site avoidance aside, the most frequently employed conservation measure in the context of archaeological resources is that of investigation. The collection of site data and the knowledge returned are viewed as compensation for site destruction.

The degree to which sites are investigated and indeed, the decision as to which sites are selected for investigation are problems of continued introspect (e.g., Ives 1985). As Ives (ibid.) ably points out, in the process of evaluating archaeological sites, there is a common confusion between the significance of impact and the significance of the resource. The former requires investigation because the site is to be totally or partially destroyed; the latter emphasizes the potential the site has to add to knowledge of the past. When significance of impact is employed as a rationale for further investigation, inevitably the extent of investigation is tied to an argument over the appropriate sampling fraction to provide representativeness. Based on site extent, a set investigation area is considered appropriate and is required of a developer. Unfortunately, there is no guarantee that the site has potential to provide data on some pertinent problem in prehistory. Consequently, there can be no guarantee that the dollars to be spent in resource investigation will provide an equitable return. Recommendations based upon significance of impact, of course, are firmly rooted in inductive archaeological research strategies.

Among most resource managers, a common consensus is surfacing that the significance of archaeological sites is intricately tied to their potential for addressing substantive research questions (see Donahue 1982b; Raab and Klinger 1977; Moratto and Kelly 1978). Donahue has argued that "given problem orientations of this nature, field archaeologists and managers will have a comparative framework in which they can evaluate redundant information, uniqueness of the resource, and site information potential" (1982b:260). In short, the significance of the site becomes the research problem that its investigation may solve. Thus, it also is the central focus of the research design. The extent of data acquisition may be defined with the parameters of the research design, therein setting realistic compensation measures. Although guarantees on real knowledge return again cannot be made, the probability is considerably higher.

So, can a developer be expected to support research as part of the normal resource management process? Since my arguments follow that potential knowledge of the past is the major rationale for significance assessment (others do exist; e.g., Moratto and Kelly 1978) and deductively based research strategies are the only means to provide that knowledge, one has to say yes. In addition, the specific requirements for, and the rationale behind, investigation are explicit and understandable. I would argue further that, in the end, developers are less likely to question such requirements and will spend less money to greater reward. Spurling (1982:51-52), on the other hand. argues that the imposition of research objectives is unethical when it increases client costs beyond the minimum required to meet contractual obligations. However, since the value of the resource lies in its potential contribution to knowledge, the minimum cannot be defined as other than the field strategy required to gain that knowledge. Thus, _it_ becomes the minimum regulatory requirement.

The question of whether bureaucratic archaeologists should realistically expect consultants to provide research designs for each and every project justifiably is a matter for debate. Spurling has hit the nail directly on the head in stating:

> ... many h.r.i.a.m.s [historical resources impact assessment/ mitigation projects] do not allow the generation of _sui generis_ research results either because of study area characteristics and/or the scope of work required. The notion that small-scale projects "lend themselves to problem-oriented research" (Schiffer 1975:1) should be dispensed with. Sufficient time, money and expertise are generally not available for every linear development overview or reconnaissance study to produce research

> results. Nor should they be. Research results can only be realistically expected at a sufficient scale and at an appropriate time in the development of a project (1982:52-53; brackets added).

Notwithstanding these statements, Spurling goes on to categorically state that once project costs pass above a threshold level, the absence of research results can neither be justified nor tolerated.

There are indeed many projects where the project scale is so small (gas/oil well sites) or the project characteristics are so constrained (pipeline/transmission line construction) that it is virtually impossible to formulate appropriate research designs. We are still faced, nevertheless, with the fact that archaeological data are being retrieved without defined purposes in data collection. This is all the more problematical given the number and varied backgrounds of the individuals recording these data. As more than one researcher has found out (e.g., Quigg and Brumley 1984), myself included, the data simply are not comparable and are, therefore, of limited value.

It is in projects of the types cited above that provincial research objectives serve their utmost purpose. Universal problems that require long term data collection may be employed to set standard guidelines for site recording and analysis. For example, the question of "why sites are located where they are" (Plog and Hill 1971) assumes that behavioral processes in site selection are universally conditioned by such variables as critical resource availability, geography, seasonality and the like. To test hypotheses about such processes, a researcher needs specific types of data that might otherwise be ignored. Attempts to gather these data after the site has been recorded and the project completed most frequently end in failure, or at best lead to tentative interpretation (see Burley and Fox 1985). Other provincially based research problems such as those focusing on interregional exchange or production technologies also may dictate collection and/or site assessment strategies. While field costs potentially could increase to meet these needs, again the consequences will be greater reward. It always has been my contention that a majority of developers swallow regulatory costs with less difficulty when there exist understandable objectives for expenditures.

Determining the scale at which an independent research design may be required of a project is fraught with complexity. Certainly, those projects resulting from impact assessment recommendations have an officially sanctioned research potential justified in light of some significant research problem. Also, most certainly, projects of massive scale, such as hydroelectric development or large scale resource extraction, require, and have had, well defined research designs (e.g., Reeves et al. 1982; Fedirchuk McCullough and Associates and Lifeways 1983; Brumley et al. 1982). In those projects of lesser scale and occurring in areas where little prior knowledge exists, one cannot be so optimistic.

I have thus far painted a one-sided portrait of cultural resource management archaeology in Alberta with regard to the formulation and implementation of research designs and consequential research results. This is not wholly true. There are a number of examples of highly structured research programmes that have provided or will provide substantive contributions to a knowledge of Alberta prehistory. There also are several excellent examples of research designs in contract settings. These, however, are more the exception than the norm.

To end this paper on a positive note and to further illustrate the basic principles and advantages inherent in a deductive strategy to archaeology, I have singled out a recent contract project for discussion. This project was implemented as mitigation/compensation for the presumed destruction of sites in the development of an irrigation reservoir in the Crawling Valley of southeastern Alberta. The project research proposal embodies most methodological components considered essential to the formulation of research designs in Alberta archaeology.

THE CRAWLING VALLEY RESERVOIR PROJECT

Crawling Valley is a relatively restricted land form covering a distance of approximately 48 km; its northern border is the Red Deer River, and the Bow River is adjacent to the southern margin. This basin has been formed by the downcutting of Matzhiwin Creek and provides a natural link between the two major drainages. Given the aridity of this general area, irrigation reservoirs are a fact of life for successful agricultural operations.

Alberta Environment was proposing to build such a reservoir in the early 1980s. The Archaeological Survey of Alberta required a Historical Resources Impact Assessment, which was carried out by ARESCO Ltd. in 1982 (ARESCO Ltd. 1983a). Based on a prefield visit to the locale, it was anticipated by the Archaeological Survey of Alberta that site density would be low and that the majority of resources would be stone circle and cairn features; only the latter proved true. The impact assessment reported 64 prehistoric sites within or adjacent to the reservoir limits (21 km^2) and general recommendations for a mitigation programme were put forward.

The Call for Proposals for site mitigation in Crawling Valley established a fixed cost for this service and emphasized the formulation of a research programme for implementation. Several proposals were received and the mitigation contract was awarded to ARESCO Ltd. ARESCO Ltd.'s research design (ARESCO Ltd. 1983b) was to focus on two sets of problems - the use of Crawling Valley by prehistoric peoples and the relationships of tipi ring features to tipi structure. It is the former problem focus upon which I will dwell.

On the basis of the previous impact assessment work, it was recognized that prehistoric sites in Crawling Valley were principally tipi ring sites limited in size to one or two rings, often with cairns. Assessment of some of these sites served to illustrate that most rings had low material culture densities and that the likelihood of placing individual sites in time by way of diagnostic artifact types or radiocarbon dates was poor. In focusing on the prehistoric use of Crawling Valley, the underlying assumption followed that a consistent land use pattern for this valley crosscut time. Hence, the majority, if not all, sites were taken to be a reflection of this pattern.

In their proposal, ARESCO Ltd. defined the main research proposition as follows:

> On the basis of the inventory which revealed a high density of sites in the Barkenhouse Lake area [a created reservoir] with significantly less density as one moves north, the conclusion was drawn that Crawling Valley served as a travel corridor linking the Bow and Red Deer and that the study area with its

> high frequency of single and double ring sites (N=45) was a stopping point on the 2 or 3 day journey from one river to the other.
>
> An alternative interpretation could be that the Crawling Valley sites reflect only the type of distribution one would encounter in a hinterland exploited from base camps in the two major river valleys, located to the north and south of the study area (1983b:2-4; brackets added).

To pursue these problems, ARESCO proposed a programme that required a knowledge of sites and features not only within the Crawling Valley reservoir but beyond its borders in the vicinities of the Bow and Red Deer rivers.

A series of hypotheses was developed to test the potential validity of the alternative propositions (ibid.:5), and the required data and strategies to gather these data were determined. For example, one of the hypotheses associated with the travel corridor land use model followed that such a corridor would concentrate occupation at either end, on the Red Deer and Bow rivers. A test implication was that site structure at either end should be similar but different from sites within the valley. More multiple ring sites, including large base camps and wintering camps, as opposed to single and double ring temporary use sites were predicted. The data required to test the hypothesis involved site inventory and mapping. Another of the hypotheses formulated to test the travel corridor model involved the estimation of occupation length for sites both within and at the ends of the valley. Complete ring excavations to determine feature and material culture densities were identified as necessary. Here the assumption was explicitly made that material culture densities, feature densities and feature types are a direct measure of occupation length. Combined with hypotheses to test the alternative model of valley use and cross correlation with the research problem of tipi ring structure noted earlier, a well laid out logical programme of research was set forth.

Whether or not the Crawling Valley project is able to specifically and conclusively identify the nature of prehistoric land use along Matzhiwin Creek between the Red Deer and Bow rivers remains to be seen. Nevertheless, the project has defined what types of data are required to address this problem and implemented appropriate strategies to gather those data. Data analysis will proceed in a systematic fashion and, hopefully, all assumptions will be explicitly defined. Whatever interpretations may be derived, other researchers should have few difficulties in determining how they were made. Because of this, there is a much greater probability that project conclusions will be accepted by colleagues.

From a cultural resource management perspective, a number of distinct benefits were recognized in the Crawling Valley research design beyond its contribution to knowledge. First, each and every component of the investigation could be justified to the proponent. In part, this influenced the proponent decision to fund work outside of the zone of impact. Secondly, because of the detail with which the data collection strategies were defined, project monitoring was readily facilitated. Finally, and probably of greatest consequence, the collected data served a defined purpose. Should a report never have been prepared by ARESCO (it has - Wright et al. 1984), there was little doubt that some other researcher could address the defined problems and come to a conclusion.

CONCLUSIONS: THE BUREAUCRATIC ARCHAEOLOGIST VIEW

Throughout this paper, I have championed the hypothetico-deductive approach to archaeological investigation and the use of explicit research designs. Certainly, I do not believe one can reduce such an approach to Binfordian "buzz words" or fantasy. A conviction to do structured research in Alberta archaeology is the only hope we have for gaining a true understanding of the past. To continue to collect or require the collection of data in the hopes that these data will either speak for themselves or be useful to some future academic's research, risks future consequence. Given the economic climate we currently face, someone will undoubtedly be asking - how much is enough? Only those projects with well formulated research designs will be able to respond.

Research designs are not some musings buried deep in the mind of a bureaucratic archaeologist. They are simply a statement of one's research objectives, a definition of the stategies and data required to meet those objectives and an explicit statement as to assumptions. It brings archaeology over the border of metaphysical impression into the realm of credibility. I would hope that ten years from now, R.G. Forbis is unable to summarize the state of Alberta archaeology as "To the glee of some and to the distress of others, works devoted to theory and hypothesis testing are virtually nonexistent" (1982:159). The challenge is there.

ABSTRACTS FOR 1983 AND 1984 PERMITS

compiled by
Gabriella Prager

The following abstracts represent those unpublished in the 1983 annual review and those for 1984 permits available at the time of publication.

83-7

John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

Alberta Housing
Corporation
Wabasca subdivision

PROJECT TYPE: HRIA

LOCATION/SETTING: In North Wabasca Lake settlement; area on a high knoll, mostly cleared, and generally disturbed.

METHODOLOGY: Surface was examined by a foot survey; this was followed by systematic tests using a backhoe and shovel-shaving; some deeper pits were excavated to test for buried living floors. Some 60 1 x 1.5 m test pits and numerous shovel tests were excavated.

RESULTS: One prehistoric site (GlPl-3) and 3 historic sites were found. GlPl-3 was interpreted as a disturbed large, widespread, thinly scattered site.

SITE TYPES: Lithic scatter, historic house foundations, protestant mission foundation

DATES: The historic buildings generally date from the 1920s to the 1940s.

REPORT: Complete, entitled "Historical Resources Impact Assessment Wabasca Residential Land Development Project No. 1385/2795/2087", by John Pollock.

83-11

John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

Amoco Canada Ltd.
Pembalta gas pipeline
loop

PROJECT TYPE: HRIA

LOCATION/SETTING: Southwest of Drayton Valley, running west from the North Saskatchewan River to cross the Pembina River; land ranges from low lying forested to rolling agricultural lands, with some muskeg areas.

METHODOLOGY: The 22 km x 10 m right-of-way was foot traversed with judgemental subsurface testing, with particular emphasis on areas of high potential.

RESULTS: Three prehistoric sites (FhPt-1, FhPs-8, FhPr-23) were found.

SITE TYPES: Isolated find, surface scatters

REPORT: Complete, entitled "Historical Resources Impact Assessment Pembalta Natural Gas Pipeline Loop from SW 5-49-9 to NE 28-48-7, W5M", by John Pollock.

83-17

John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

Dome Petroleum Ltd.
Lindbergh '24'
experimental thermal
project

PROJECT TYPE: HRIA

LOCATION/SETTING: South of Elk Point, Alberta; land is gently rolling, hummocky moraine and mostly cultivated.

METHODOLOGY: 259 ha were examined by a series of regularly spaced foot transects, with judgementally placed subsurface tests; all areas of high potential were more intensively examined and tested.

RESULTS: Six prehistoric sites (FkOq-4 to 9) and 4 historic sites were found. FkOq-4 yielded a side notched projectile point.

SITE TYPES: Isolated finds, surface scatters, campsite

CULTURAL AFFILIATION: FkOq-4 - Besant

DATES: On the basis of projectile point typology, FkOq-4 is dated at ca. 1000-2000 years ago.

REPORT: Complete, entitled "Historical Resources Impact Assessment Lindbergh '24' Experimental Thermal Project Section 24-55-6-W4M", by John Pollock.

83-19

Brian Reeves
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Underwood McLellan Ltd.
Sleeping Giant country
subdivision

PROJECT TYPE: HRIA

LOCATION/SETTING: In Crowsnest Pass, at the west end of Tecumseh Creek; some terrace features included.

METHODOLOGY: The study area of 21 ha was foot traversed, with judgementally placed shovel tests.

RESULTS: Three prehistoric sites (DjPp-66,67,68) were located. Evidence suggests a Middle and Late Prehistoric cultural affiliation for the campsites.

SITE TYPES: Campsites, isolated find

REPORT: Complete, entitled "Historical Resources Impact Assessment, Sleeping Giant Property", by Brian Reeves.

83-22
John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

Nick Kohlman
Residential subdivision

PROJECT TYPE: HRIA

LOCATION/SETTING: West of Ponoka, Alberta, on the edge of a small lake; area is covered by mixture of bush, trees, pasture and muskeg.

METHODOLOGY: The 11.44 ha were subjected to intensive surface examination and subsurface testing.

RESULTS: No sites were found.

REPORT: Complete, entitled "Historical Resources Impact Assessment Part of the NW 1/4, Section 6, Township 43, Range 25, W4M", by John Pollock.

83-27
John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

Alberta Transportation
Stewart gravel pit/SR 657

PROJECT TYPE: HRIA

LOCATION/SETTING: Stewart gravel pit is located north of the Milk River, near Highway 62; occurs on 2 terraces in prairie landscape; the lower one is almost totally disturbed. SR 657 is located south of Bonnyville, in a forested area; right-of-way was completely disturbed.

METHODOLOGY: Since much of the area for both these projects was extensively disturbed, the best that could be done was a thorough surface inspection.

RESULTS: No new sites were found.

REPORT: Complete, entitled "Historical Resources Impact Assessment Two Alberta Transportation Projects (a) Hwy. 62, (Stewart Pit) NE 5-2-21-W4M (b) SR 657, SE 13-59-5-W4M", by John Pollock.

83-29

John Brumley
Ethos Consultants Ltd.
Group Box 20, Veinerville
Medicine Hat, Alberta

Archaeological Society of Alberta
Laidlaw Site

PROJECT TYPE: Research

LOCATION/SETTING: Near the community of Bow Island, on a north terrace of the South Saskatchewan River valley; the terrain is moderately undulating to flat, and covered by shortgrass prairie.

METHODOLOGY: The site area was mapped and subjected to limited test excavation and augering.

RESULTS: Four cultural features were identified, including 2 stone circles, a rectangular excavated stone enclosure with drive lines, and a circular mass of stones immediately adjacent to the enclosure. All identifiable faunal remains recovered were antelope (only 5 specimens) and most unidentifiable bone fragments were antelope size. Very few lithic remains were recovered. The stone enclosure has been interpreted as an antelope trap, while the circular mass of stones is suggested to possibly represent a shaman structure.

SITE TYPE: Antelope kill site

REPORT: Complete, entitled "The Laidlaw Site: An Aboriginal Antelope Trap from Southeastern Alberta (D1Ou-9)", by John H. Brumley.

83-32

John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

Cameron Acres Ltd.
Mulhurst subdivision

PROJECT TYPE: HRIA

LOCATION/SETTING: At the hamlet of Mulhurst, on the southeast shore of Pigeon Lake; mostly flat to gently sloping land covered by dense aspen growth.

METHODOLOGY: Area of about 20 ha was examined by a judgemental foot transect with subsurface tests every 30 m.

RESULTS: No sites were found.

REPORT: Complete, entitled "Historical Resources Impact Assessment Part of NW 1/4, Sec.14, Twp.47, Rge.28, W4M. Stage No. 2 and Future Stage No. 3 Mulhurst, Alberta", by John Pollock.

83-44

John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

Alberta Transportation
Hwy 940 and Gorge Creek Trail

PROJECT TYPE: Mitigative excavations at EiPs-7, EdPq-15,16

LOCATION/SETTING: Fallentimber Creek on Hwy. 940:14, north of the Trans-Canada Highway, within the Montane forest; Gorge Creek Trail, Sheep River Wildlife Sanctuary, Kananaskis Country; in foothills covered by young pine and mature aspen.

METHODOLOGY: Block excavations at all 3 sites were placed in productive areas as indicated by systematic shovel tests. Sizes of blocks were 20 m^2 at EiPs-7 and 16 m^2 at each of EdPq-15 and 16. Excavation was mostly by trowel with screening through 6 mm mesh.

RESULTS: 660 specimens were recovered from EiPs-7 and a hearth feature was excavated. 1996 specimens were recovered from EdPq-16 and a lithic workshop area was excavated. 504 specimens were recovered from EdPq-15, suggesting mainly food preparation/cooking, but some reduction of local lithic bedrock cores was also undertaken. EdPq-16 was found to be a large, rich site.

SITE TYPES: Campsites/lithic workshops

CULTURAL AFFILIATION: EiPs-7 - McKean, Pelican Lake
EdPq-16 - Besant, Avonlea

DATES: Based on projectile point typology, EiPs-7 dates 1500 B.C. - A.D.700; EdPq-16 dates A.D.100 - A.D.1000.

REPORT: Complete, entitled "Mitigative Excavations at Sites EiPs-7 on Hwy. 940:14 and EdPq-15 and EdPq-16 on the Gorge Creek Trail, Kananaskis Country", by John Pollock.

83-56

Bea Loveseth
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Manalta Coal Ltd.
Montgomery Mine mitigation

PROJECT TYPE: Mitigation of EiOw-101

LOCATION/SETTING: Near Sheerness, Alberta, in a cultivated field; on an area of raised relief overlooking a shallow slough.

METHODOLOGY: An area of approximately 3000 m^2 was systematically surface collected, with absolute provenience recorded. A 2 x 2 m unit was excavated in the area with the largest artifact concentration.

RESULTS: Seven discrete artifact concentrations were identified, suggesting activity areas; 53 artifacts were recovered, consisting of debitage and large stone tools.

SITE TYPE: Campsite

REPORT: Complete, entitled "Final Mitigation EiOw-101, Shop/Dragline area, Montgomery Mine, Sheerness, Alberta", by Bea Loveseth.

ADDITIONAL INFORMATION: The effects of relative degrees of surface visibility on systematic surface collection of ploughed sites were examined in this study. Furthermore, a significant size difference between collected and excavated artifacts was attributed to ploughing.

83-58

Brian Reeves
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

G. Peters
Crowsnest Pass
residential subdivision

PROJECT TYPE: HRIA

LOCATION/SETTING: In the Crowsnest Pass, near Coleman, Alberta; area characterized by open pine-spruce forest, aspen groves and grasslands, overlooking the Crowsnest Valley.

METHODOLOGY: Area of about 8 ha was subjected to a ground reconnaissance, with inspection of surficial exposures and shovel testing in areas of moderate to high potential.

RESULTS: No sites were found.

REPORT: In preparation

83-60

Bea Loveseth
Lifeways of Canada Ltd.
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Calgary, Alberta

Alberta Transportation
SR 813 access roads/
SR 855 borrow sources

PROJECT TYPE: HRIA

LOCATION/SETTING: The borrow source investigation was located northeast of Endiang, Alberta, in a prairie/parkland transitional zone characterized by hummocky moraine. The access road study was located on the east shore of Calling Lake in an area of mixed woodland.

METHODOLOGY: The 13 proposed borrow sources together involved an area of about 5.74 ha and were intensively examined and shovel tested. The access roads encompassed an area of about 950 m^2 and were on the edge of a rich archaeological site (GhPh-11); this area was thoroughly shovel tested.

RESULTS: Borrow source investigation revealed 3 new prehistoric sites (FaPa-3,4,5). Access road investigation discovered no new sites and added little new to the knowledge of GhPh-11.

SITE TYPES: Lithic scatters

REPORT: Complete, entitled "Historical Resources Impact Assessment of Borrow Sources Along SR 855:04 and Tenure Lot Accesses to SR 813:04", by Bea Loveseth.

83-61

Stanley Saylor
Ethos Consultants
Group Box 20, Veinerville
Medicine Hat, Alberta

North Canadian Oils Ltd.
Atlee-Buffalo area
pipeline system

PROJECT TYPE: HRIA

LOCATION/SETTING: South of Cavendish and Buffalo, north of Suffield Military Reserve; primarily shortgrass prairie with some cultivated areas; terrain ranging from strongly rolling, hummocky to gently rolling to level.

METHODOLOGY: Rights-of-way about 41 km long and 15 m wide were examined by foot traverses with judgementally placed shovel tests.

RESULTS: Three new sites (EeOp-47 to 49) were found.

SITE TYPES: Stone circles, cairns

REPORT: Complete, entitled "An Historical Resource Impact Assessment of a North Canadian Oils Gas Pipeline Development", by Stanley G. Saylor.

83-65

John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

TransAlta Utilities
Dome-West Pembina
transmission line

PROJECT TYPE: HRIA

LOCATION/SETTING: West of the Brazeau Dam, largely in rolling, forested foothills terrain; the project crosses the wide and deep Elk River valley.

METHODOLOGY: The 13 km long right-of-way was largely traversed on foot with judgemental subsurface testing.

RESULTS: One prehistoric site (FfPx-2) was located. It was judged to be significant for this area.

SITE TYPE: Lithic workshop

REPORT: Complete, entitled "Historical Resources Impact Assessment Dome-West Pembina 138 kV Transmission Line 801 BL", by John Pollock.

83-66

John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

Husky Oil Ltd.
Kitscoty gas pipeline

PROJECT TYPE: HRIA

LOCATION/SETTING: Near Lloydminster, across rolling land, mostly cultivated or in pasture.

METHODOLOGY: The 19 km x 15 m right-of-way was foot traversed, with judgemental subsurface testing, emphasizing areas of high potential and site areas.

RESULTS: Seven prehistoric sites were found (FhOn-9 to 15); FhOn-14 yielded 2 projectile points.

SITE TYPES: Isolated finds, surface scatters, campsite

DATES: FhOn-14 - Late Prehistoric, based on projectile point typology.

REPORT: Complete, entitled "Historical Resources Impact Assessment Kitscoty Solution Gas Pipeline in Twp.50, Rge.2&3, W4M", by John Pollock.

83-70	**B.O.K. Reeves** **Lifeways of Canada Ltd.** **317 - 37 Avenue, N.E.** **Calgary, Alberta**	**Alberta Transportation** **SR 509 Highway alignment**

PROJECT TYPE: HRIA

LOCATION/SETTING: On the Blood Reserve, 10 km northwest of Lethbridge; right-of-way cuts across Oldman River at Kipp; study area involves prairie level and river terraces.

METHODOLOGY: The entire 27 km right-of-way was examined on foot by a two person crew. Systematic backhoe testing at 20 m intervals was conducted along lower and upper terraces south of Oldman River; limited test excavation of selected features on lower terrace.

RESULTS: A major and very significant site complex (DkPf-2) was identified at Slough Bottoms (south of Oldman River), consisting of remains of a whiskey trade post (operated 1871-72), associated native campsites, three native graves, various trash deposits, cabin foundation remains and numerous rock features. Also identified were 2 prehistoric sites (DkPf-51,52).

SITE TYPES: Historic complex, cairns and prehistoric campsite, prehistoric campsite

DATES: DkPf-2 - 1870s plus prehistoric component

REPORT: In preparation

83-72	Edward J. McCullough H.S.A. Historical Studies Associates Inc. 6607 Bowness Road, N.W. Calgary, Alberta	Slave River Hydro Project Study Group Hydro-electric investment study

PROJECT TYPE: Pre-Investment Phase I (pilot sampling program)

LOCATION/SETTING: The study area includes the margins of the Slave River below the 214 m contour between Fort Chipewyan, Alberta and Fort Smith, Northwest Territories. The terrain in the study area consists of low forested floodplains, sand terraces, deltaic deposits, and granite bedrock outcrops.

METHODOLOGY: The historical resources study consisted of ethnographic and archival research and two field components: 1) a probabilistic sampling program which was designed to obtain data on the quantity and types of sites occurring in the study area; and, 2) a judgemental program which focused on investigating areas which had good potential for prehistoric sites.

RESULTS: The judgemental program recorded 45 prehistoric sites of which 28 are located along Slave River. The remaining 13 sites are located inland, and 8 of these were associated with bedrock outcrops along Murdoch Creek, La Butte Creek, Dog River, and an abandoned channel adjacent to Slave River; 5 sites were recorded along the Fort Chipewyan winter road near Murdoch Creek. The probabilistic program recorded 7 prehistoric sites, of which 5 were previously recorded.

In the region between the confluence of the Peace and Athabasca rivers and Fort Smith, archival research identified 46 historic sites. Ethnographic research identified 48 historic sites, of which 11 had also been identified by the archival research. Six additional historic sites were recorded during the archaeological pilot sampling program.

In the Peace - Athabasca Delta, 68 historic sites were identified; 21 were identified through archival studies and 47 were found through ethnographic research.

SITE TYPES: Isolated finds (IhOu-5,6,9, IhOv-3 to 6, IiOu-12, IiOv-1, IjOu-14,16,17, IlOv-14,17,23,26);
Artifact scatters (IhOt-1, IhOu-7,8, IiOs-5, 6, IiOt-1,2, IiOu-13,14, IjOu-11,12,13,15, IkOu-3, IkOv-7 to 13, IlOv-15,16,18,19,20,22,24,25);
Cairns (IhOt-2, IhOu-4)

REPORT: Complete, entitled "Archaeological and Historical Resources Assessment Phase I Slave River Hydro Project" (in 7 volumes), by H.S.A. Historical Resources Studies Associates Inc.

83-75

John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

Galaxy Promotions Ltd.
Alberta Beach
recreational subdivision

PROJECT TYPE: HRIA

LOCATION/SETTING: At the summer village of Alberta Beach, near Lac Ste. Anne, on rolling, mostly treed land.

METHODOLOGY: The 23.5 ha parcel of land was examined by judgemental foot transects with regularly spaced subsurface tests. A thorough surface inspection was also made of disturbed areas.

RESULTS: Two prehistoric sites (FkPo-13,14) were located.

SITE TYPES: Isolated find, surface scatter

REPORT: Complete, entitled "Historical Resources Impact Assessment Part of NW1/4-23-54-3-W5M Summer Village of Alberta Beach", by John Pollock.

83-78

John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

Nova, An Alberta Corporation
Bittern Lake lateral pipeline

PROJECT TYPE: HRIA

LOCATION/SETTING: Southwest of Camrose, crossing the Battle River; primarily cultivated land or pasture, on mostly flat to gently rolling terrain with numerous knolls in the north section.

METHODOLOGY: The 9.6 km x 18 m right-of-way was examined by zigzag foot traverse, with subsurface testing every 100 m or less.

RESULTS: Four prehistoric sites (FfPg-3 to 6) were found.

SITE TYPES: Surface scatters, isolated finds

REPORT: Complete, entitled "Historical Resources Impact Assessment Proposed Bittern Lake Lateral in LSD 6-30-46-21-W4M to LSD 7-29-45-21-W4M", by John Pollock.

83-88

B.O.K. Reeves
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Alberta Transportation
SR 509 Burials

PROJECT TYPE: DkPf-2 burials exhumation, analysis and reinterment.

LOCATION/SETTING: At Slough Bottoms, on the Blood Reserve, 10 km northwest of Lethbridge.

METHODOLOGY: Excavation of three graves with detailed photographic and sketch work coverage. Detailed analysis was undertaken before reinterment of skeletons and grave goods.

RESULTS: Four native individuals with considerable quantities of associated grave goods were identified. One individual was estimated to be 2 to 2 1/2 years of age, another 4 to 4 1/2 years and a third, an adult female carrying a full term foetus, was aged 30 to 35 years. The two child burials were accompanied by numerous trade items, including glass and brass beads, cartridge cases, a glass bottle, various printed and woven fabrics, brass arm bands and rings, and numerous other significant items. The adult female, who most probably died in labour, had fewer grave goods associated. Although contemporaneity of the burials cannot be exactly determined, it is likely that they date within a close time period.

CULTURAL AFFILIATION: Closest comparison to beaded blanket strip fragment found in Grave B are items from Blackfoot Confederacy artwork.

DATES: Most probably the Whiskey Trade era (1870s); certain artifact characteristics suggest early to mid 1870s.

REPORT: Complete, entitled "Final Report Alberta Transportation Project Proposed SR 509 Alignment DkPf-2 Burials", by B.O.K. Reeves, M. Kennedy and O.B. Beattie.

83-91

John Brumley
Ethos Consultants
Group Box 20, Veinerville
Medicine Hat, Alberta

Alberta Environment
Forty Mile Coulee
reservoir

PROJECT TYPE: Mitigation at DkOu-4,5,6,7,16,17,31,48,49,50

LOCATION/SETTING: In Forty Mile Coulee, southeastern Alberta, northeast of Foremost; all sites are on top of coulee edge, in gently to moderately rolling terrain covered by typical open plains grassland.

METHODOLOGY: All sites were recorded by aerial photography, and features were mapped; after each stone circle was mapped, auger holes were placed in and around the feature. At DkOu-16 and 17, several cairns were excavated by 1 m x 1 m units; at DkOu-16 and 31, 3 and 5 (respectively) stone circles were test trenched, and a new procedure, controlled surface stripping, was tested at these 2 sites. Areas adjacent to the above 3 sites were also tested by backhoe.

RESULTS: This mitigation project recovered 758 cultural items, excluding bone. Auger testing at DkOu-4,5,7,17,48,49 recovered relatively low quantities of cultural materials; at DkOu-6 and 50, no cultural items were found in auger holes. At DkOu-31, despite a large area examined by trenching and surface stripping, only 61 cultural items were recovered, mostly quartzite cores, debitage, MRSTs and FCR. At DkOu-16, a combination of surface collecting, 28 m^2 of trenching and 17 1 x 1 m test pits recovered a total of 644 lithic items, mostly FCR, cores and debitage, but also including a late side notched projectile point (Nanton style). Surface stripping also revealed 2 activity areas: 1 concentration of FCR only, and 1 of FCR and bone fragments; some of the latter bone was dated.

SITE TYPES: Stone circles and cairns

CULTURAL AFFILIATION: DkOu-16 - Nanton (Late Prehistoric)

DATE: DkOu-16, on bone from feature, 300±80 B.P. (A.D. 1460-1690).

REPORT: Complete, entitled "Historical Resources Investigations within the Forty Mile Coulee Reservoir Project: Summary and Evaluation of 1983 Fieldwork", by Barry J. Dau and John Brumley.

83-115	**John Brumley** **Ethos Consultants** **Group Box 20, Veinerville** **Medicine Hat, Alberta**	**Alberta Recreation and Parks** **Lower Kananaskis Lake campground**

PROJECT TYPE: HRIA

LOCATION/SETTING: On the east shore of Lower Kananaskis Lake, in the Rocky Mountains southwest of Calgary; area is covered by a montane forest of lodgepole pine, white spruce, Englemann spruce.

METHODOLOGY: The areas of proposed disturbance within the 250 m x 50 m development area were examined by surficial inspection and shovel testing; two previously identified sites (EdPs-40,42) were re-examined.

RESULTS: Cultural material was found in 9 of 25 test holes, and was represented by flakes and bone fragments. Only 1 of the previously known sites (EdPs-40) was relocated.

SITE TYPE: lithic workshop

REPORT: Complete, entitled "A Heritage Resource Impact Assessment of a Proposed Walk-in Campground along Lower Kananaskis Lake", by John H. Brumley.

84-1

Mike Quigg
Ethos Consultants Ltd.
Group Box 20, Veinerville
Medicine Hat, Alberta

Dome Petroleum Ltd.
Jenner gas gathering
system

PROJECT TYPE: HRIA

LOCATION/SETTING: Just east of Jenner on the northwest corner of the Suffield Military Reserve; flat to gently rolling prairie with some cultivation.

METHODOLOGY: The 15 m wide right-of-way was foot traversed. Surface exposures were inspected and shovel tests were conducted.

RESULTS: Three sites were discovered within the right-of-way: EdOs-26, EeOs-28 and 29.

SITE TYPES: campsites, stone circle

REPORT: Complete, entitled "Dome's Jenner Gathering System: An Historical Resource Impact Assessment", by J. Michael Quigg.

84-3

Bea Loveseth
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Alberta Transportation
Cowley borrow pit

PROJECT TYPE: HRIA to determine relationship of DjPm-1 to existing borrow source.

LOCATION/SETTING: South bench of the Crowsnest River, 3.6 km north of Cowley, Alberta; in prairie environment (grasslands).

METHODOLOGY: Area of proposed expansion was shovel tested (N=10) and tested by 1 x 1 m unit on ring; portion of site in expansion area was mapped.

RESULTS: Twenty-six complete or partial stone circles and one rock alignment were identified in area of concern. Rings are deeply sodded, but considerable disturbance to rings was observed. Ring diameters ranged from 4.0 to 6.0 m. Nineteen of the rings contained double rows of stones; central hearths were present in 10 rings. One siltstone flake was observed in site area.

SITE TYPE: Stone circle

REPORT: Complete, entitled "Final Report, Archaeological Investigations Tipi Ring Site DjPm-1, ASA Permit No. 84-3", by Bea Loveseth.

84-4	Eugene M. Gryba 3, 346 - 4th Avenue, N.E. Calgary, Alberta	County of Vulcan Little Bow River bridge crossing

PROJECT TYPE: HRIA

LOCATION/SETTING: Southern Alberta, shortgrass prairie; within and on both sides of a major meltwater channel now occupied by the Little Bow River, near Carmangay.

METHODOLOGY: Generally, survey involved an extensive foot traverse and visual inspection of available exposures, followed by an intensive shovel test program of identified high to medium potential areas. Matrix was usually sifted through a screen having a 6.0 x 2.9 mm diamond shaped mesh. This was supplemented by backhoe testing of river valley terraces and valley edge sand dune deposits.

RESULTS: Two extensive prehistoric sites (EaPh-4,5) were discovered, within and outside the proposed highway alignment, along the western terrace and on the valley floor, respectively.

SITE TYPES: Buried campsites

REPORT: Complete, entitled "Historical Resources Impact Assessment of the Little Bow River Crossing near Carmangay", by Eugene M. Gryba.

84-7	John Pollock Settlement Surveys Ltd. 19 Addison Crescent St. Albert, Alberta	Mr. Stanley Tkachuk Lac La Biche subdivision

PROJECT TYPE: HRIA

LOCATION/SETTING: Northeast of Lac La Biche, Alberta, adjacent to Claude Lake; flat to gently rolling land.

METHODOLOGY: Intensive surface and subsurface inspection of 18.53 ha.

RESULTS: One site (GeOx-51) was located near the shore of Claude Lake (Lake No. 2). It consisted of a large quartzite flake.

SITE TYPE: Isolated surface find

REPORT: Complete, entitled "Historical Resources Impact Assessment Pt. SW 1/4, 15-67-13-W4M Lac La Biche, Alberta", by John Pollock.

84-9

Stanley Van Dyke
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Edmonton Power
Genesee Power Project

PROJECT TYPE: Mitigation, FiPo-138

LOCATION/SETTING: 8.8 km north of St. Francis, Alberta; in Parkland on an elevated escarpment immediately adjacent (west) to Genesee Creek.

METHODOLOGY: Phosphate survey and systematic screened shovel tests over area of site previously pedestaled and avoided to identify artifact concentrations; excavation of 61 m^2 in three blocks, the central block being the most extensive; the eastern block surrounded a previous 2 x 2 m test excavation carried out in 1982 (Ronaghan, Hanna and Thorpe 1983).

RESULTS: Western and eastern blocks were abandoned when artifact densities were found to dissipate rapidly at margins of block. Central block yielded Late Prehistoric component characterized by small side notched projectile point, a high number of bifaces, an axe, and high frequency of large stone tools; site lacks stratigraphy.

SITE TYPE: Small campsite

DATES: Late Prehistoric Period, based on projectile point typology.

REPORT: Complete, entitled "Final Report, Impact Mitigation, FiPo-138, Genesee Power Project", by Stanley Van Dyke. Report compares assemblage to adjacent ploughed field excavations and collections.

84-10

Stanley Van Dyke
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Fording Coal Limited
Genesee Project
mine area

PROJECT TYPE: HRIA

LOCATION/SETTING: About 3 km north of St. Francis, Alberta, in mixed parkland with cultivated fields; area includes margins of Genesee Basin, a remnant of the late glacial Beverly Channel.

METHODOLOGY: Study area is 1741 ha, of which 1188 were cultivated and 553 were wooded. Flexible foot traverses of ploughed fields, assessment of previously known and new sites, with shovel testing in areas of archaeological potential. Wooded areas were examined by means of foot traverses of areas of potential with systematic shovel testing.

RESULTS: Studies resulted in the discovery of 76 new prehistoric sites (FhPn-138 to 172, FhPo-28 to 44, FiPn-307 to 330) and the assessment of 24 previously identified prehistoric sites. Only 9 of the new sites had not been previously disturbed by agricultural activities. Thirty-six of the sites consisted of an isolated find, normally a quartzite flake. Typically, stratigraphy was absent, preservation was limited and single components were represented. Besides the 4 roughly dateable sites noted below, 4 other prehistoric sites contained chipped stone axes which have previously been most strongly associated with Middle Prehistoric assemblages. Based on the observed results of the study, it appears that the previously reported strong association of prehistoric sites with the lower portions of the basin is confirmed.

SITE TYPES: Isolated finds (36), small finds (27), lithic scatters (9), campsites (4)

CULTURAL AFFILIATION:
FiPn-126 - Oxbow
FhPo-31 - Taltheilei, McKean

DATES: All are based on projectile point typology.
FhPn-31 - Early Prehistoric
FiPn-323 - Late Prehistoric
FiPn-126 - Middle Prehistoric
FhPo-31 - Late Prehistoric, Middle Prehistoric

REPORT: Complete, entitled "Historical Resources Impact Assessment, Fording Coal Mine Reserve", by Stanley Van Dyke.

84-11

Bea Loveseth
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Alberta Environment
Badger Reservoir

PROJECT TYPE: HRIA and Mitigation

LOCATION/SETTING: Approximately 45 km east of Vulcan, Alberta, in prairie grasslands, partially disturbed by cultivation.

METHODOLOGY: The HRIA was conducted on 11 quarter sections of land and involved parallel foot traverses at 50 m intervals. EcPc-1 and 4 were phosphate tested, mapped and sample excavated, 3 rings and 24 m^2 at EcPc-1 and 12 m^2 plus 1 1/2 rings at EcPc-4. Mitigation studies included excavation of 4 m^2 on 2 rings at EcPc-26 and mapping of rings; mapping and excavations of cairn at EcPc-44; mapping of 4 rings and 2 cairns at EcPc-45 and excavation of 4 m^2; mapping of stone feature of EcPc-46; mapping and excavation of cairn at EcPc-41; testing of EcPc-30 with 2 x 2 m unit; mapping of 4 rings and 2 cairns (effigy?) at EcPc-42; excavation of 1 2 x 2 m unit at EcPc-29 as a test and 12 m^2 as mitigation; and the excavation of 10 1 x 1 m units at EcPc-12. Some backhoe tests were also used.

RESULTS: The HRIA resulted in the location of 65 archaeological sites (EcPc-4 to 69). Work at EcPc-26 resulted in the recovery of 10 items, and EcPc-44 yielded only 1 bone fragment. EcPc-45 had a hearth, and bone, charcoal and FBR were recovered. EcPc-29 contained a deeply buried hearth and excavations revealed another hearth, some choppers, scrapers and debitage. EcPc-30 contained 4 buried occupations, none of which contained diagnostic material. EcPc-42 contained 2 circular features and yielded bone, FBR, quartzite debitage and a pot sherd. EcPc-12 revealed 2 components, a surficial Old Women's occupation and a Late Middle Prehistoric component containing a variety of projectile points. At EcPc-1, one occupation (Oxbow) was identified; 114 lithic artifacts and bone were recovered. EcPc-4 revealed 2 occupations in 2 different rings, Besant and Late Plains side notched; 164 lithic artifacts and some bone fragments were recovered.

SITE TYPES: Tipi rings, cairns, lithic scatters, surface campsites, buried stratified campsites, rock feature site, isolated finds

CULTURAL AFFILIATION: Oxbow, Hanna, Besant, Old Women's, Late Plains side notched, based on projectile point typology.

DATES: On the basis of projectile point typology, sites represent a range of time periods in the Middle Prehistoric and Late Prehistoric periods.

REPORT: In preparation; to be entitled "Mitigative Studies at Badger Reservoir, ASA Permit No. 84-11", by Bea Loveseth.

84-12

John Brumley
Ethos Consultants Ltd.
Group Box 20, Veinerville
Medicine Hat, Alberta

Eastern Irrigation
District
Rangeland cultivation

PROJECT TYPE: HRIA

LOCATION/SETTING: About 20 km southwest of the town of Brooks, Alberta; on primarily level land covered by native prairie.

METHODOLOGY: The 1036 ha study area was traversed by vehicle; any exposures (especially the numerous blowout areas) or clusters of stone were closely examined. Two previously known sites were re-examined (EdPb-1,4).

RESULTS: Three new sites (EdPb-7,8,9) were located. None of the sites were judged to be significant.

SITE TYPES: Stone circle, buried campsites, cairn, isolated find

REPORT: Complete, entitled "A Heritage Resource Impact Assessment of a Proposed Range Improvement Area near Brooks, Alberta", by John H. Brumley.

84-13

W. J. Wood
W. J. Wood Consulting
801, 715 - 5th Avenue, S.W.
Calgary, Alberta

Wildwood Regional
Recreation Board
Peers recreation area

PROJECT TYPE: HRIA

LOCATION/SETTING: Northeast of Edson, north of Peers on the south side of the McLeod River; area largely forested, including willow-poplar to mature conifer.

METHODOLOGY: Within the proposed 59 ha development area, foot transects and systematic shovel testing were undertaken throughout the forested lands. All natural and other exposures were visually examined.

RESULTS: One site, FkQa-6, was located through subsurface testing. Exposure of the site revealed it to consist of a small hearth, the remains of lithic reduction activities and a small amount of burned bone in and around the hearth. It would appear to be a small short term camp located near the edge of an abrupt escarpment and a small creek.

SITE TYPE: Small buried campsite

REPORT: Complete, entitled "Peers Recreation Area Historical Resource Impact Assessment", by W.J. Wood.

84-14

Mike Quigg
Ethos Consultants Ltd.
Group Box 20, Veinerville
Medicine Hat, Alberta

Alberta Recreation and Parks
Picnic area mitigation

PROJECT TYPE: Evaluation of EaPg-3 (10 stone circles)

LOCATION/SETTING: Near Carmangay, located on a terrace just north of the Little Bow River. The site, a stone circle camp, suffers from ongoing impact through use of a government picnic area and new facility installation.

METHODOLOGY: Each stone circle was mapped with eight stones per feature weighed and depths recorded. A systematic augering program of 81 holes preceded the excavation of 10.5 m^2.

RESULTS: One intact FBR pit feature was excavated immediately outside Stone Circle 5. Bone, FBR, and debitage were recovered from the excavation. The FBR from the pit feature revealed spalling and hackled breaks. Evidence suggested short term occupation.

SITE TYPE: stone circle site

CULTURAL AFFILIATION: Undetermined, but most probably Late Prehistoric

REPORT: Complete, entitled "Evaluation of Stone Circle Site, EaPg-3", by J. Michael Quigg.

84-15

John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

Texaco Canada Ltd.
Bonnie Glen to West Pembina NGL pipeline

PROJECT TYPE: HRIA

LOCATION/SETTING: From west of Pigeon Lake, central Alberta to just east of the North Saskatchewan River; in the aspen parkland; crossing gently rolling farmland, several streams and some forested areas.

METHODOLOGY: Complete foot traverse of 72 km x 15 m pipeline right-of-way with judgemental subsurface testing.

RESULTS: 18 sites were located: FgPl-1 to 3, FgPm-1, 2, FgPn-1, 2, FgPo-2, 3, FgPp-12 to 15; FgPq-2 to 5, FhPr-24.

SITE TYPES: Isolated surface finds, surface scatters, surface camps, buried campsites, buried lithic and bone scatters.

REPORT: Complete, entitled "Historical Resources Impact Assessment proposed NGL pipeline Bonnie Glen to West Pembina", by John Pollock.

84-16

Rebecca Balcom
ARESCO Ltd.
2912 - 18 Street, N.E.
Calgary, Alberta

Gulf Canada Resources Inc.
Garrington-Caroline pipeline

PROJECT TYPE: HRIA

LOCATION/SETTING: Caroline area, 40 km south of Rocky Mountain House; aspen parkland setting, with crossings of the Clearwater and Raven rivers.

METHODOLOGY: Foot traverse and shovel testing along 19 km of proposed pipeline route.

RESULTS: FaPq-7 was recorded on the north bank of the Clearwater River.

SITE TYPE: Isolated find

REPORT: Complete, entitled "Historical Resources Impact Assessment Garrington-Caroline Pipeline Project", by Rebecca Balcom.

84-17

Rebecca Balcom
ARESCO Ltd.
2912 - 18 Street, N.E.
Calgary, Alberta

Wellore Resources Ltd.
Jenner well sites

PROJECT TYPE: HRIA

LOCATION/SETTING: In native prairie on the north side of the Red Deer River, 15 km north of Jenner (55 km northeast of Brooks).

METHODOLOGY: Foot traverses and shovel tests of two well sites; return visit to relocate well sites.

RESULTS: Two sites were recorded - EfOs-41 and 42.

SITE TYPE: Both are multiple tipi ring sites with lithic scatters.

REPORT: Complete, entitled "Historical Resources Impact Assessment, Wellore Resources Ltd. Jenner Wellsites", by Rebecca Balcom.

84-18

Eugene M. Gryba
3, 346 - 4th Avenue, N.E.
Calgary, Alberta

Alberta Recreation and Parks
Saskatoon Island Provincial Park

PROJECT TYPE: HRIA

LOCATION/SETTING: On aspen and saskatoon forested former island of Saskatoon Lake in rolling terrain west of Grande Prairie. Soil consists of stone free to slightly stony sticky clay and glacial till.

METHODOLOGY: Foot traverse of entire park area, followed by intensive shovel tests concentrated along current and old lake shores; eighty-four 50 by 70 cm shovel tests were opened. Soil was generally too saturated to permit screening.

RESULTS: Three small prehistoric sites were discovered; GhQs-5 is situated along an old shore of Saskatoon Island Lake, while GhQs-6 and GhQs-7 overlook Little Lake. No diagnostic artifacts were recovered.

SITE TYPES: Surface scatter, isolated find, hearth

REPORT: Complete, entitled "Historical Resources Impact Assessment of Saskatoon Island Provincial Park near Grande Prairie", by Eugene M. Gryba.

84-20

B.O.K. Reeves
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Hydrocon Engineering (Continental) Ltd.
Tyrrell Lake fishing access

PROJECT TYPE: HRIA

LOCATION/SETTING: Located 11 km north of Warner, 52 km southeast of Lethbridge, Alberta; native grass and shrubs characterize slopes of ephemeral drainage and bench; upper prairie level previously ploughed.

METHODOLOGY: Foot traverse of 29.2 ha property; surficial examination of area at large, with detailed inspection of areas planned for proposed development and undisturbed lands.

RESULTS: Paleontological finds include mineralized broken bison metacarpal eroded out of sands laid down in a high energy fluvial environment prior to the late Holocene. The historic remains of a farmstead were located at the northwest corner of the parcel. Two prehistoric sites were identified (DjPb-2, 3); DjPb-2 consists of an oval shaped rock ring, 2 x 1 m, made up of staked and piled sandstone slabs, possibly representing a vision quest site. DjPb-3 consists of a stone circle characterized by widely spaced cobbles, possible central hearth, and a diffuse scatter of quartzite spalls and fire broken rock. Associated are a cairn and an area of exposed artifacts.

SITE TYPES: Paleontological, possible vision quest site, stone circle/cairn, farmstead

REPORT: Complete, entitled "Historical Resources Impact Assessment, Tyrrell Lake Fishing Access Site Development", by B.O.K. Reeves.

84-23

Sheila J. Minni
9604 - 151 Street
Edmonton, Alberta

City of Red Deer
Waskasoo Park

PROJECT TYPE: Mitigative excavation of FbPk-7

LOCATION/SETTING: Site is located on a grassy knoll (Piper's Mountain) at the confluence of Piper and Waskasoo creeks within the City of Red Deer.

METHODOLOGY: Block excavation of a 12 m^2 area by 1 m x 1 m and 1 m x 2 m units excavated in arbitrary 5 cm levels using trowel and shovel and screen.

RESULTS: Exposure of two stratigraphically distinct cultural layers. Activity areas in each layer indicated that the site functioned as a campsite for occupants who relied primarily on bison for food. Volcanic ash was not present on the site, as initially thought.

SITE TYPE: Buried campsite

CULTURAL AFFILIATION: Probably Late Prehistoric

DATES: Upper cultural layer associated with ceramic sherds dating about A.D. 500 to A.D. 1800; lower cultural layer not dated.

REPORT: Complete, entitled "FbPk-7 Piper's Mountain Excavation", by Sheila J. Minni.

84-24

John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

Apex Gravel Ltd.
Gravel pit

PROJECT TYPE: HRIA

LOCATION/SETTING: Northeast of Edmonton on former oxbow of the North Saskatchewan River; area level and cultivated.

METHODOLOGY: Foot traversed in regularly spaced transects with subsurface tests placed judgementally.

RESULTS: Nine prehistoric sites were located, FjPh-81 to FjPh-89.

SITE TYPES: All are surface scatters or isolated finds - no buried components.

REPORT: Complete, entitled "Historical Resources Impact Assessment of the Galloway Property N 1/2 Section 1 and SE 1/4 Section 12, Twp. 54, Rge. 23, W4M", by John Pollock.

84-25

Sheila J. Minni
9604 - 151 Street
Edmonton, Alberta

Mr. J. Ducs
Mayfair Village
subdivision

PROJECT TYPE: HRIA

LOCATION/SETTING: Northwestern Alberta, 30 km northeast of Grande Prairie; flat to sloping terrain dominated by two small creeks which join within the study area.

METHODOLOGY: Non-structured foot traverse of 64.2 ha study area, with 75 judgementally placed shovel tests.

RESULTS: One site, GiQq-10, was located along a creek margin. Site consisted of prehistoric cultural materials recovered from surface exposure and through testing.

SITE TYPE: Campsite

REPORT: Complete, entitled "Final Report, Historical Resources Impact Assessment, Country Residential Subdivision", by Sheila J. Minni.

84-26

Mike Quigg
Ethos Consultants Ltd.
Group Box 20, Veinerville
Medicine Hat, Alberta

Alberta Transportation
SR 879 Improvement

PROJECT TYPE: Mitigation excavations of 5 stone circle sites (DiOu-7 to 11).

LOCATION/SETTING: In prairie region just south of Foremost on north side of Etzicom Coulee.

METHODOLOGY: Mapped individual sites and 18 stone features; recorded features in detail (weights and depths of stones); excavated 146 auger holes plus 102 m^2 in and around features.

RESULTS: A single Besant point was found at both DiOu-8 and 9, with FBR scatter and central hearth in one ring at each site, respectively. Minor amounts of Knife River Flint were found at each site as well. Age undetermined at other 3 sites (DiOu-7, 10 and 11). All contained sparse debitage and FBR in upper 20 cm.

SITE TYPES: All are short term stone circle campsites, with DiOu-8 and 9 each having a stone rectangle in conjunction with stone circles.

CULTURAL AFFILIATION: DiOu-8 and 9 are both Besant (and possibly DiOu-7 as well), with two large (9 m diameter) stone circles and imported lithics.

REPORT: In preparation

84-27

John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

W-Five Construction Ltd.
Mayfair Village mobile
home subdivision

PROJECT TYPE: HRIA

LOCATION/SETTING: Within the boundaries of the town of Devon, Alberta; gently rolling cultivated land with two ravines.

METHODOLOGY: Systematic foot traverses with regularly spaced subsurface tests of a quarter section of land. Mitigative work consisting of a systematic surface collection was undertaken at FiPk-52.

RESULTS: Six prehistoric sites were located (FiPk-47 to 52); one site, FiPk-52, is ca. 700 m E-W by 150 m N-S, and contained two Besant projectile points.

SITE TYPES: Surface scatters, undisturbed buried components and isolated finds

CULTURAL AFFILIATION: Besant

REPORT: Complete, entitled "Historical Resources Impact Assessment of Mayfair Village, SE 27-50-26-W4M, and Mitigative Work at Prehistoric Archaeological Site FiPk-52", by John Pollock.

84-28	**James Helmer** **Department of Archaeology** **University of Calgary** **Calgary, Alberta**	**Alberta Culture** **Strathcona Site**

PROJECT TYPE: Research/archaeology field school; continuing excavations at FjPi-29.

LOCATION/SETTING: On the east side of the North Saskatchewan River, in the County of Strathcona, near the eastern limits of the City of Edmonton.

METHODOLOGY: Following a stratified cluster sampling design, 21 1 x 1 m units were excavated. The stratified random sampling survey which was planned for Tp 251, Rge 25 was again cancelled due to land access problems.

RESULTS: Approximately 4500 lithic artifacts and bone fragments were recovered, including a complete range of tool and debitage types.

SITE TYPE: Lithic workshop/habitation

CULTURAL AFFILIATION: Middle Prehistoric and Late Prehistoric (Oxbow, Duncan, McKean, Pelican Lake, Avonlea and Old Women's)

DATES: ca. 5000 B.P. to contact, based on projectile point typology.

REPORT: 1984 progress report on the Strathcona archaeological field school in preparation.

84-29	**John Pollock** **Settlement Surveys Ltd.** **19 Addison Crescent** **St. Albert, Alberta**	**Alberta Transportation** **Hwy. 29 mitigation/Shaw gravel pit**

PROJECT TYPE: Mitigation of Haruppchuk homestead (FjPm-6) and HRIA of Shaw gravel pit.

LOCATION/SETTING: The homestead is 8 km east of Stony Plain; the gravel pit is near Steeper, Alberta on flat land covered with forest.

METHODOLOGY: The homestead mitigation consisted of archival research, mapping and photographing the buildings and features, and the excavation of 4 1 x 1 m units in a refuse deposit; assessment of the gravel pit area involved regularly spaced foot transects with subsurface tests every 50 m or less.

RESULTS: The early homestead was documented and found to have been occupied ca. 1913 - 1943. A representative sample of artifacts was obtained through excavation. No sites were located at the Shaw gravel pit.

SITE TYPE: Historic homestead

REPORT: Complete, entitled "Historical Resources Mitigation of a Homestead on Hwy. 29:02 and an Historical Resources Impact Assessment of the Shaw Gravel Pit on Hwy. 40", by John Pollock.

84-30	**John Pollock** **Settlement Surveys Ltd.** **19 Addison Crescent** **St. Albert, Alberta**	**Joseph Doz** **Recreational subdivision**

PROJECT TYPE: HRIA

LOCATION/SETTING: Near Edmonton Beach, on Cottage (Spring) Lake; mostly rolling pasture with some forest.

METHODOLOGY: Area 20.8 ha surveyed by systematic zigzag surface examinations and judgementally placed subsurface tests.

RESULTS: One prehistoric site (FkPm-7) was located.

SITE TYPE: Surface camp

REPORT: Complete, entitled "Historical Resources Impact Assessment Pt. NW 1/4, 30-52-1-W5M Summer Village of Edmonton Beach", by John Pollock.

84-31	**Heinz Pyszczyk** **Archaeological Survey** **of Alberta**	**Alberta Culture** **Historic Dunvegan** **Mission and Fort**

PROJECT TYPE: HRIA, test excavations at Anglican Mission and archaeological assessment of 1878 - 1918 Fort Dunvegan.

LOCATION/SETTING: At historic Dunvegan, approximately 24 km south of Fairview, Alberta, on the river flats on the north side of the Peace River; north end of St. Saviour's Mission is cultivated while the fort area is landscaped and contains farm facilities.

SITE TYPES/DATES: St. Saviour's Anglican Mission (1879 - 1895); H.B. Co. Fort Dunvegan (1878 - 1918).

METHODOLOGY: Systematic shovel testing of cultivated field at St. Saviour's; test excavations (.5 x 2 or 3 m trenches) were placed to locate buildings and other historic features at the fort.

RESULTS: St. Saviour's excavations revealed:

1. Very light lithic scatter at the south edge of the field. No diagnostics were found.
2. Very light scatter of historic artifacts (i.e., glass, ceramics, clay pipes).

Fort Dunvegan excavations revealed:

1. Foundation and cellar remains of 3 buildings and a building attachment on the Factor's House;
2. An artifact and faunal assemblage which spanned the fur trade period but also included materials from later occupation of the site.

REPORT: In preparation, and will include a thorough description of the history, excavation techniques, as well as structural and artifact descriptions and results.

84-32

B.O.K. Reeves
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

City of Lethbridge
Urban Parks Project

PROJECT TYPE: Historical Resources Inventory

LOCATION/SETTING: Eight areas located within the city of Lethbridge; areas included coulee and prairie edges in plains environment.

METHODOLOGY: Archival, file and field studies were designed to provide inventory of historic and prehistoric sites in development area; systematic foot traverses of areas of concern were carried out.

RESULTS: Four historic sites (DkPf-61 to 64) and 19 prehistoric sites (DkPf-55 to 60, DkPf-65 to 67, DkPe-47 to 58) were identified on the Paven Project area. The Lethbridge Concrete Project area contained 8 prehistoric sites (DkPf-20, 23, 68 to 72). The Dick

Grey Property contains the William Stafford Sr. and William Stafford houses and air shaft for the No. 3 mine. The Filatoff and Whitney Sand and Gravel Properties include a farmstead, evidence of historic trails and three prehistoric sites (DjPe-10 to 12).

SITE TYPES: Homesteads, mine remains, historic trails, isolated finds, small finds, campsites, cairns, cairn complexes, buried tipi ring site, buried campsites

REPORT: Complete, entitled "Final Report, Historical Resources Inventory, City of Lethbridge, Urban Parks Project, Areas 1, 2, 3 and Other Properties", by B.O.K. Reeves.

84-33

Margaret Kennedy
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

TransAlta Utilities Corporation
Section 5, 500 kV Crowsnest Pass powerline

PROJECT TYPE: Major conservation program consisting of assessment and mitigation excavations at a number of site locales.

LOCATION/SETTING: Crowsnest Pass, southwestern Alberta; sites in right-of-way were situated at Allison Creek, McGillivray Creek, Gold Creek valley, north side of Bluff Mountain, and top of Livingstone Range.

METHODOLOGY: Project consisted of assessment excavations at 8 sites (DjPp-12, 63 and 64, DjPo-27, 107, 109, 137, 156) with HRIAs carried out within or adjacent to the right-of-way as new construction needs arose. Conservation excavations were conducted at DjPo-27, 107, and 156.

RESULTS: The sites investigated reflect seasonal utilization of resources outside the main Crowsnest Valley. The huge prehistoric site complex DjPo-107, located in the Gold Creek valley, displayed distinct activity areas such as intense bone processing and lithic reduction/ workshop localities. Detailed conservation excavations resulted in the identification of a new subphase in the Crowsnest cultural sequence (i.e., Lees Lake Subphase), a transitional Late Middle to Late Prehistoric Period subphase.

A major test excavation program at DjPo-137, the Livingstone Quarries, resulted in the recovery of roughly 30,000 Etherington chert artifacts, mainly reflecting primary reduction. A number of obviously imported quartzite hammerstones were found. Finished or roughly finished tools were rare. No diagnostic items other than a side notched point preform were found. DjPo-156, on the north side of Bluff Mountain, revealed quantities of a distinct variety of white Etherington. The site appears to date to the Late Middle to Late Prehistoric Period.

DjPo-27, located on a small knoll on Gold Creek, consisted of a prehistoric campsite/workshop and historic homestead dating to the operation of Lille (1903-1912). A limited conservation program was conducted in the prehistoric site, while the homestead was avoided. At DjPp-12, a prehistoric campsite situated on the west side of McGillivray Creek, a Mummy Cave Complex style point was identified during test excavations. However, the site's information content was minimal, overall.

DjPp-63 was an isolated find on the high terrace edge east of Allison Creek. Shovel testing did not reveal any further cultural materials, and no further work was carried out. DjPp-64 was a small knoll campsite on the east side of McGillivray Creek. Shovel testing revealed that the site was of minimal archaeological potential. DjPo-109 was identified as a possible Etherington chert workshop, but limited assessment excavations did not produce significant results.

SITE TYPES: Lithic workshops, habitation sites, campsite/workshop, historic homestead, campsites, isolated find

CULTURAL AFFILIATION: DjPo-107 - Mapleleaf Subphase (Early Middle Prehistoric) and Lees Lake Subphase (Late Middle-Late Prehistoric Periods)
DjPp-12 - Mummy Cave Complex (Early Middle Prehistoric)

DATES: Based on projectile point typology:

DjPo-107	5500-3000 B.C.
DjPp-12	5500-4000 B.C.

REPORT: In preparation

84-34

Barry J. Dau
Ethos Consultants Ltd.
Group Box 20, Veinerville
Medicine Hat, Alberta

Alberta Transportation
Hwy. 1 twinning

PROJECT TYPE: Mitigation - mapping and test excavation of six archaeological sites threatened by highway development.

LOCATION/SETTING: Area 1 was situated on the southern edge of a broad coulee containing Ross Creek, approximately 20-25 km east of Medicine Hat along the Trans-Canada Highway. Area 2 was located within an existing gravel pit situated on the western edge of the Oldman River valley, approximately 16 km north of the town of Taber. Both areas were located in essentially open grassland environments.

METHODOLOGY: Assessment procedures at the sites evaluated (D1Oo-10, 11, 12, 14, 15 and D1Pb-4) involved mapping and auger testing of all stone circles plus the mapping of a select number of cairns. Limited surface collections were also undertaken as a part of the mapping process. Excavations (1 x 1 m) took place at certain features of each site that had been selected by the Archaeological Survey of Alberta for evaluation. A total of 4 m^2 were excavated at each designated feature.

RESULTS: Twenty-eight stone circles were mapped, surface collected and auger tested; 13 cairns and a single stone alignment were mapped. A total of 136 1 m x 1 m test pits were excavated to depths of 20 cm below surface. This work resulted in the recovery of 426 cultural items (105 in surface collection, 14 in auger testing and 307 in excavation), mainly debitage, cores, flakes, FBR. A single post mold was also found in the centre of Stone Circle 4 at D1Oo-10. No diagnostic items were recovered.

SITE TYPES: Stone circle/cairn/stone alignment sites suggestive of short term campsite locales.

DATES: Fill from the post mold in Stone Circle 4 at D1Oo-10 resulted in a date of 15,180±360 years B.P. (BETA 10813); the sample was obviously contaminated.

REPORT: Complete, entitled "Trans Canada Highway Project 1:22: Assessment of Stone Circle Sites in Southeastern Alberta", by Barry J. Dau.

84-35
Jack Brink
Archaeological Survey
of Alberta
Alberta Culture
Head-Smashed-In
Buffalo Jump

PROJECT TYPE: Mitigation and research

LOCATION/SETTING: In southwestern Alberta, on the eastern side of the Porcupine Hills, some 16 km west of Fort Macleod.

METHODOLOGY: Research excavations were conducted at the processing site using 2 m^2 units with 10 cm x 50 cm provenience. All identifiable bone, fire broken rock and features were mapped in place. Mitigation excavations were conducted in proposed development areas and employed a similar methodology.

RESULTS: A 56 m^2 contiguous area of the processing site below the kill was completely excavated. Cultural deposits were shallow, extending to only 20 cm below surface. Evidence of multiple occupation and a lack of stratigraphy have resulted in a compressed and confused record of bison butchering and processing. Analysis has focused on patterns of processing as modeled by Speth and Binford, and on a flake analysis similar to one initiated by Frison. Other research initiated in 1984 included studies of the H.S.I. drive lanes, the petroglyphs, a nearby vision quest site, and an experimental study of bone taphonomy and site feature replication.

SITE TYPES: Buffalo jump and associated camp/processing areas, as well as vision quest site and petroglyph site.

REPORT: Preliminary report in this volume; final report in preparation.

84-36	**Brian Ronaghan** **Archaeological Survey of Alberta**	**Alberta Culture** **Burmis-Lundbreck Corridor**

PROJECT TYPE: Research, resource management: systematic assessment of previously recorded prehistoric sites in a 41 km^2 (16 mi^2) potential development area known as the Burmis-Lundbreck Corridor.

LOCATION/SETTING: In the foothills area of southwestern Alberta at the front of the Crowsnest Pass; the corridor encompasses both sides of the Crowsnest River valley for a distance of 10.5 km. A wide variety of topographic and depositional situations exists in this windswept plains-mountain transitional zone.

METHODOLOGY: Known sites were visited and visually examined. Stone feature sites were mapped and a systematic set of observations were recorded for each feature. Sites characterized by buried or surficial cultural material were mapped and controlled test excavations were conducted.

RESULTS: Eighteen of the 74 known prehistoric sites in the corridor were examined and 3 new sites (DjPn-120,121, 122) were identified in the first phase of this study. Ten stone feature sites were mapped and 5 buried sites were tested. Stone features generally consisted of moderately to poorly defined tipi rings and cairns located on broad outwash terraces. One possible ceremonial site (DjPn-112), consisting of a circular arrangement of large cairns, was mapped and tested. Buried sites generally proved to be sparse but deeply stratified. Two sites produced evidence of occupations prior to Mount Mazama ashfall (6845±50 years B.P.).

SITE TYPES: Tipi rings/cairns, buried campsites, possible ceremonial site

CULTURAL AFFILIATION: Unknown at present but projectile point styles reflect those found elsewhere in the Crowsnest Pass, with recovered specimens provisionally assigned to Oxbow, Hanna, Pelican Lake and Avonlea phases. One large point recovered below Mazama Ash is stylistically identical to Pelican Lake but most certainly represents a very early corner notched form.

DATES: Bone and charcoal samples are not yet analysed.

REPORT: In preparation

ADDITIONAL INFORMATION: The intent of this study is to provide an overall assessment of prehistoric site significance within the project area and to allow small scale private development to proceed without loss of valuable resources. Further field study will be necessary to meet this objective.

84-37	**Bruce Ball** **Archaeological Survey** **of Alberta**	**Alberta Culture** **Research and monitoring** **in Central Alberta**

PROJECT TYPE: Research and assessment of FfPq-3, FgPq-3, FbPi-1, and the Sheerness Project Area.

LOCATION/SETTING: FfPq-3, the Chobot site, is located at the southeast end of Buck Lake, on the border between Alberta's aspen parkland and the foothills of the Rockies. FgPq-3, the Logan site, is situated on top of the hill which overlooks the town of Bittern Lake, in the aspen parkland. FbPi-1, the Miller site, is located on the north bank of the Red Deer River in the area of the river known as Big Bend, west of Stettler, in aspen parkland. The Sheerness Project area is located southeast of Hanna, and is typical northern prairie.

METHODOLOGY: Testing at the Chobot site consisted of the excavation of 5 1 m^2 test units, shovel tests and soil probes. Twelve 1 m^2 units were excavated at the Logan site. The Miller site and the Sheerness area were surveyed by surface examination only.

RESULTS: The Chobot site was mapped and the depth of deposits recorded; it is largely undisturbed. The Logan site is disturbed, and was found to contain a range of point styles. The Miller site was found to be an undisturbed buffalo jump site with an associated campsite. Thirty-six new sites were recorded in the Sheerness Project area.

SITE TYPES: Lithic scatters, stone circles, buried lithic concentrations and stone circles, isolated find, possible historic townsite, historic building, farmstead

DATES: On the basis of projectile point typology, the Chobot site dates to the Middle Prehistoric Period, and the Logan site ranges from the early Middle Prehistoric to the Late Prehistoric Period.

REPORT: In preparation

84-39

Bruce Wright
ARESCO Ltd.
2912 - 18 Street, N.E.
Calgary, Alberta

Loyal Order of Moose
Medicine Hat recreational site

PROJECT TYPE: HRIA

LOCATION/SETTING: Within the City of Medicine Hat, overlooking Seven Persons Creek; land is relatively flat and is covered by grass with cactus and some low shrubs.

METHODOLOGY: Study area of 19 ha was examined by systematic foot transects with subsurface tests.

RESULTS: One prehistoric site was located (EaOq-35).

SITE TYPE: Isolated find on surface

REPORT: Complete, entitled "Historical Resource Impact Assessment Medicine Hat Moose Lodge Recreation Common", by Bruce Wright.

84-40	Jim Calder Lifeways of Canada Ltd. 317 - 37 Avenue, N.E. Calgary, Alberta	TransAlta Utilities Corporation Langdon to B.C. transmission line

PROJECT TYPE: HRIA

LOCATION/SETTING: Project consists of four sections running from Langdon to Frank Lake, crossing Stimson Creek and following Breeding Valley; area includes grasslands, rolling hills, rugged forested hills with grass covered south facing slopes and valley walls; major crossings include Bow River and its major tributaries and Oldman River.

METHODOLOGY: Archaeological studies have been ongoing since 1983. Sections were traversed by foot, shovel tests placed in areas of high potential and/or on tower locations. Impact mitigation undertaken where necessary to clear sections under construction.

RESULTS: Section I contained a single prehistoric site (EePk-280) which was evaluated with 10 m^2 of excavation and yielded 2 components, one containing a pot sherd and one containing a Pelican Lake point. Section II contained 18 prehistoric sites (EcPk-11 to 15, EdPk-18 to 21; EcPl-8 to 14, DkPn-26, 27) of which 5 were considered to be significant (EdPk-20, EcPk-12, EcPl-8, 10, 13). Section III contained 4 prehistoric sites (EcPm-3 to 5, EcPn-19). Section IV contained 3 sites (DkPn-25, DlPn-4, 5).

SITE TYPES: Campsites, small finds, isolated finds, cobble pavement, kill site, multicomponent campsite, buried campsites, stone rings

CULTURAL AFFILIATION: EePk-280 - Pelican Lake

DATES: EePk-280 - ca. 3000-1800 B.P., based on projectile point typology.

REPORT: In preparation, to be entitled "Historical Resources Impact Assessment, 500 kV Transmission Line, Langdon to B.C. Border, Sections I-IV, and Impact Mitigation", by J.C. Calder.

84-42	Michael R.A. Forsman Archaeological Survey of Alberta	Alberta Culture Boundary Creek N.W.M.P. Post

PROJECT TYPE: Site assessment for designation purposes.

LOCATION/SETTING: In Police Outpost Provincial Park, in the eastern slopes/foothills of southwestern Alberta, 50 km southeast of Cardston; on the south shore of Outpost Lake; area characterized by open grassland, willows and poplar.

METHODOLOGY: Historical research to locate original subdivision land survey notes, documentary literature review, site traverses to locate structural features, shovel testing to determine the presence of buried cultural material, test excavation of 1 m x 1 m units established on grid to assess site preservation and expose construction details.

RESULTS: All historical data indicated that the site was of minor importance. The barracks could not be located and could be under water, since the lake level is higher now than when the detachment was surveyed in 1893. A well, largely overgrown, was found in a wooded area and appeared to be in a good state of preservation. The foundation remains of the stable were in an open, grassy meadow and were partially exposed by test excavation. Log foundation remains were discontinuous, fragmentary and very poorly preserved. Rodent activity was the major cause of site disturbance.

SITE TYPE: North West Mounted Police post, minor detachment of Fort Macleod.

DATES: 1891 - 1899

REPORT: In preparation

84-44

Bea Loveseth
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Top Notch Construction Limited
Badger Reservoir borrow sources

PROJECT TYPE: HRIA

LOCATION/SETTING: Six km west of Bow City, on prairie level, escarpment and fossil floodplain on south side of Bow River; in Plains grasslands environment.

METHODOLOGY: Zigzag foot traverses at intervals of approximately 50 m covered an area of approximately 68 ha.

RESULTS: Eleven prehistoric sites were identified and assessed (EcPb-1 to 11). Five of the sites were undisturbed.

Sites are associated with the prairie level in protected pockets (N=3), on the valley bottom (N=3), in coulees (N=3) and/or prominent points along the prairie edge (N=2).

SITE TYPES: Tipi rings, cairns, effigy, stone feature, lithic scatter/workshop

REPORT: Complete, entitled "Final Report, Historical Resources Impact Assessment, Gravel Borrow Sources, Badger Reservoir Site, ASA Permit Number 84-44", by Bea Loveseth.

84-46	**Michael R.A. Forsman Archaeological Survey of Alberta**	**Alberta Culture Victoria Methodist Mission site**

PROJECT TYPE: Mitigation of McDougall Methodist Mission house (GaPc-7) at Victoria from impact by small farming operation; provision of interpretive research information on building construction and material culture.

LOCATION/SETTING: In the Parklands of central Alberta, 120 km northeast of Edmonton, on the north bank of the North Saskatchewan River. The site exists on the third terrace above the river, in a cultivated field.

METHODOLOGY: The site was surveyed and a grid was established for excavation of 1 m x 1 m units. Excavation was by shovel and trowel, with screening of excavated soils through 6 mm mesh to recover cultural material. Structural remains were exposed by trowel and brush, and wooden structural elements were stablized for recording. Five people were allocated to this project over a 10 day period.

RESULTS: Over 100 m^2 were excavated, exposing most of the house area and a kitchen addition. Construction attributes recorded were timber sizes, the location of two fireplaces, the existence of floor jousts and flooring, a front porch addition, a large cellar under the house with an extension under the kitchen addition, and a separate small refuse filled pit under the kitchen addition. A large material culture sample was also recorded.

SITE TYPE: Methodist mission house

DATES: 1863 - 1907+

REPORT: In preparation

84-47	**Michael R.A. Forsman Archaeological Survey of Alberta**	**Alberta Culture Historic Fort Macleod**

PROJECT TYPE: Mitigation and assessment as well as site research.

LOCATION/SETTING: On an island in the Oldman River, at Fort Macleod; grassy setting.

METHODOLOGY: Test excavations were by shovel and trowel, with screening of excavated soils through 6 mm mesh to recover cultural material. Structural remains and subsurface depression features were exposed by trowel and brush. Excavation attention was divided between 2 site areas: 1. along the river bank to carry out mitigation and assessment of impact from river bank erosion; and 2. at the hypothetical commercial end of the main street to establish physical correlation between archaeological remains and historic photographic data.

RESULTS: Over 200 m^2 were excavated at the site. Test excavations along the river bank revealed that the historic occupation was undisturbed and capped by sterile alluvial sands and silts 40 to 50 cm deep. In the second site area, about 100 m from the river, structural remains (corral posts) occurred at 10 cm below surface, but previous cultivation had slight impact. Possibly 50,000 artifacts were recovered.

SITE TYPE: Townsite

DATES: 1874 - 1884 (official date of town's move to new location), but some artifact deposits were found dating to ca. 1905.

REPORT: In preparation

84-50	**Stanley Van Dyke Lifeways of Canada Ltd. 317 - 37 Avenue, N.E. Calgary, Alberta**	**Gulf Canada Products Company West Fenn Field pipeline**

PROJECT TYPE: HRIA

LOCATION/SETTING: Parkland area north of Big Valley in hummocky terrain; area consisting of a mixture of undisturbed woodlands and grasslands and cultivated fields.

METHODOLOGY: Foot traverse with shovel testing of areas with potential for prehistoric occupation along 10.4 km right-of-way.

RESULTS: No prehistoric sites were identified.

REPORT: Complete, entitled "Historical Resources Impact Assessment, Gulf Canada Product Company, West Fenn Field Crude Oil Pipeline, Twp. 36, Rges. 20 and 21, W4M", by Stanley Van Dyke.

84-52
Heinz Pyszczyk
Archaeological Survey of Alberta
Alberta Culture
Ukrainian Farm Sites/
Myrnam Blacksmith Shop

PROJECT TYPE: Research, for the Ukrainian Cultural Heritage Village Project; recovery of architectural information and artifact assemblages.

LOCATION/SETTING:

A. Makowichuk farm is located approximately 3 miles northeast of Smoky Lake in an open, cultivated field;
B. Rosychuk farm is located approximately 5 miles northeast of Smoky Lake in an open, cultivated field;
C. Yurko farm is located approximately 3 miles northeast of Hairy Hill in an open, cultivated field;
D. Myrnam Blacksmith Shop is located on Railway Street in Myrnam, Alberta.

SITE TYPES: A,B,C are Ukrainian homesteads; the Myrnam Blacksmith Shop consisted of an early smithy and residence.

METHODOLOGY:

1. Excavations of various building areas at the homestead sites to recover structural information.
2. Excavations on the former blacksmith shop site to determine whether any structural remains were left.
3. Between 60 and 185 50 cm and 2 1 m test units were excavated to sample each of the homestead sites.

RESULTS:

1. Makowichuk barn floor was completely excavated and mapped.
2. Yurko house cellar was delineated and mapped.
3. Sidewalks, gates, and gardens were located and mapped at the Myrnam Blacksmith site.
4. Relatively large artifact and faunal assemblages were recovered with the sample excavations.

REPORT: Currently in preparation, and will include a comprehensive description of the history of, and fieldwork conducted at, each site as well as descriptions (qualitative and quantitative) and analyses of all structural information and artifact/faunal remains found.

84-53

Stanley Van Dyke
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Syncrude Canada Ltd.
Oil Sands Lease No. 22

PROJECT TYPE: Inventory and assessment

LOCATION/SETTING: North of the existing plant site, approximately 50 km north of Fort McMurray, Alberta; extensive areas of muskeg, modest areas of aspen/spruce and small areas of pine; significant areas include the shore of the Athabasca River and the channels of the Dover, Beaver and MacKay rivers.

METHODOLOGY: Archaeological survey consisted of the systematic shovel testing of areas of archaeological potential, based on proximity to waterbodies and/or association with significant breaks in slope and/or elevated and well drained areas; 7608 systematic shovel tests were excavated in the course of 153 man-days of field survey.

RESULTS: Thirty-two prehistoric sites were identified (HgOv-55 to 81, HgOw-4 to 7, HhOw-6) and 6 previously identified sites were visited and assessed. Of the 2845 artifacts recovered, only 19 were classified as tools, and none were chronologically or culturally diagnostic. In addition to the Beaver River Quarry related sites, two clusters of prehistoric sites were found to be associated with tributaries where they intersect the escarpment which separates the Dover and Clearwater plains. The prehistoric resources of the central and western portions of the lease tend to be limited.

SITE TYPES: Lithic scatters ranging from isolated finds (N=10) to large lithic scatters associated with the Beaver River Quarry.

REPORT: Complete, entitled "Historical Resources Impact Assessment, Syncrude Canada Ltd. Lease No. 22", by Stanley Van Dyke and B.O.K. Reeves.

84-55

Rebecca Balcom
ARESCO Ltd.
2912 - 18 Street, N.E.
Calgary, Alberta

Westmin Resources Ltd.
Lindbergh water supply pipeline

PROJECT TYPE: HRIA

LOCATION/SETTING: Six km southeast of Elk Point on the south side of the North Saskatchewan River; aspen parkland.

METHODOLOGY: Surface examination and judgemental shovel testing along the 16 km pipeline route.

RESULTS: Three sites were found (F10q-3, Fk0q-10, Fk01-11).

SITE TYPES: All are isolated finds.

REPORT: Complete, entitled "Historical Resources Impact Assessment Lindbergh Water Supply Pipeline", by Rebecca Balcom.

84-56

Eugene Gryba
3, 346 - 4th Avenue, N.E.
Calgary, Alberta

Alberta Transportation/
Recreation and Parks
Provincial park
developments/Callaghan
gravel pit expansion

PROJECT TYPE: HRIA

LOCATION/SETTING: Several areas in central and southern Alberta: Zeiner Provincial Park near Thorsby, Little Fish Lake Provincial Park in the Hand Hills near Drumheller, Dinosaur Provincial Park in the Red Deer River Badlands near Brooks, and a gravel pit in the High River district.

METHODOLOGY: Generally, an extensive foot traverse and visual inspection of available exposures, followed by an intensive shovel test program of identified high to medium potential areas. Matrix was usually sifted through a screen of 6.0 by 2.9 mm diamond shaped mesh.

RESULTS: One historic foundation and cellar (EiPb-15) and 9 prehistoric sites (EiPb-1, and new sites EiPb-16 to EiPb-23) were examined at Little Fish Lake Provincial Park. No undisturbed productive areas were located at the previously recorded sites EdPk-3 and EdPk-9 in the vicinity of the Alberta Transportation quarry. No new sites were discovered at Zeiner and Dinosaur provincial parks.

SITE TYPES: Campsites, cairns, stone rings

REPORT: Complete, entitled "Historical Resources Impact Assessment of Dinosaur, Little Fish Lake and Zeiner Provincial Parks and the Proposed Callaghan Borrow Pit", by Euguene M. Gryba.

84-57

B.O.K. Reeves
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Royal Bank of Canada
Elbow River Country
Club

PROJECT TYPE: HRIA

LOCATION/SETTING: Located approximately 16 km west of Calgary, on the south side of the Elbow River, in a broad valley characterized by a low, partially forested floodplain.

METHODOLOGY: Foot traverse of knoll on which club house construction is planned, complemented with backhoe testing.

RESULTS: Three known prehistoric sites were re-examined (EgPn-114 to 116) and 1 new site was located (EgPn-302). EgPn-114 is undisturbed and lies on the lower river terrace. EgPn-115 is situated on a high terrace and has been impacted by access road construction. EgPn-116 is located at the base of the Club House Hill and has been completely destroyed. EgPn-302 was identified on the top of the Club House hill. It consists of fire cracked rock, rock filled hearths and quartzite spalls observed at a depth of approximately 15 to 20 cm. Additional clusters of fire broken rock and hearths were identified at various locations on the hill.

SITE TYPE: Campsite

REPORT: Complete, entitled "Final Report, Historical Resources Impact Assessment, Elbow River Country Club, ASA Permit No. 84-57", by B.O.K. Reeves.

84-58

John Brumley
Ethos Consultants
Group Box 20, Veinerville
Medicine Hat, Alberta

Alberta Transportation
Upgrading of Wildcat Road

PROJECT TYPE: Mitigation excavation of 16 stone circle sites (DiOo-1 to 7, DiOp-3 to 6, DjOo-39, 40, 45 to 47) and four buried campsites (DjOo-41 to 44).

LOCATION/SETTING: In and around Medicine Lodge Coulee, west of Elkwater, Alberta; sites are located on open prairie surfaces, on prairie edge and on slope of coulee wall.

METHODOLOGY: All stone circle sites were mapped and 39 stone circles individually mapped. Controlled surface collecting was carried out within and surrounding all mapped features. As well, 52 m^2 were excavated within and adjacent to 11 stone circles. At the 4 buried campsites, controlled surface collecting was carried out in locally deflated areas. A total of 97 m^2 were excavated, with 57 m^2 being at site DjOo-43.

RESULTS: A substantial quantity of non-diagnostic lithic material was recovered (primarily from surface collecting) for use in interpreting site activities. Three features, probably stone boiling pits, were located and excavated in association with 3 stone circles. One of these features contains sufficient bone for dating. Of the buried campsites, diagnostic cultural material was recovered only at site DjOo-43.

SITE TYPES: Stone circle sites, buried campsites

CULTURAL AFFILIATION: DjOo-43 - Pelican Lake

REPORT: In preparation

84-59

Edward J. McCullough
Fedirchuk McCullough & Associates Ltd.
6607 Bowness Rd., N.W.
Calgary, Alberta

Rozsa Petroleum Ltd.
Knappen well sites

PROJECT TYPE: HRIA

LOCATION/SETTING: Three well sites located northeast of Milk River, Alberta were examined during this project. All of the proposed well site areas are situated in rangeland.

METHODOLOGY: The proposed well sites were examined by foot traverse, with visual surface examination and shovel testing.

RESULTS: Two prehistoric sites (DgOv-95, 96) were located. Minor restriction of the development within the well site at DgOv-95 was recommended to avoid the stone circles.

SITE TYPES: Stone circles, artifact scatter

REPORT: In preparation, to be entitled "Historical Resources Impact Assessment Rozsa Petroleum Limited Knappen Well Sites", by E.J. McCullough.

84-60

Jim Calder
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Rainbow Pipe Line Co. Ltd.
Senex - Sawn Lake
pipeline extension

PROJECT TYPE: HRIA

LOCATION/SETTING: Wabasca River crossing in boreal forest area of northern Alberta; study site is located approximately 210 km north of Lesser Slave Lake; project includes approximately 130 km of right-of-way, but main concern is Wabasca River crossing.

METHODOLOGY: Foot traverse of 3 km of 15 m wide right-of-way at Wabasca River crossing. Three transects were walked along right-of-way with shovel tests excavated on slightly elevated areas back from the river and on small terrace remnants on the valley wall.

RESULTS: No prehistoric sites were identified.

REPORT: Complete, entitled "Historical Resources Impact Assessment, Rainbow Pipe Line Company Ltd., Senex - Sawn Lake Pipeline Extension, Wabasca River Crossing, ASA Permit Number 84-60", by Jim Calder.

84-61

Edward J. McCullough
Fedirchuk McCullough &
Associates Ltd.
6607 Bowness Rd., N.W.
Calgary, Alberta

Historical Resources
Foundation/ Alberta
Culture
Lac La Biche trading
posts

PROJECT TYPE: Research and assessment

LOCATION/SETTING: The project is situated along the southern shore of Lac La Biche, Alberta.

METHODOLOGY: The study consisted of two components: 1) test excavations at the Hudson's Bay Company's Lac La Biche Post (GeOx-13; 1853-1917) to determine the effects of landscaping on the site and to evaluate its significance within the context of the local and regional history; and, 2) field survey to identify and locate the Hudson's Bay Company's Greenwich House (GePa-23) built by Peter Fidler in 1799 and the North West Company's Red Deers Lake House I (GePa-16) built by David Thompson in 1798. Prior to the field studies, an extensive archival study was conducted in order to obtain information on the location and contents of these sites.

RESULTS: Test excavations revealed that much of the Lac La Biche Post is intact, has not been disturbed by landscaping activities, and warrants preservation. The locations of Greenwich House and Red Deers Lake House I have been tentatively identified. Magnetometer studies, extensive test excavations, and analysis of the cultural remains will be required to verify the identities of these sites. The potential site of Red Deers House I is scheduled for landscaping in the near future.

SITE TYPES: Fur trade forts

REPORT: In preparation, to be entitled "The Fur Forts of Lac La Biche", by E.J. McCullough.

84-62	Rebecca Balcom ARESCO Ltd. 2912 - 18 Street, N.E. Calgary, Alberta	Manalta Coal Ltd. Montgomery Mine expansion

PROJECT TYPE: Mitigative mapping and excavation at EiOw-205,207,251, 255,256,265,280.

LOCATION/SETTING: Native prairie in Sheerness, near Hanna.

METHODOLOGY: Sites and features were mapped and some systematic surface collection was undertaken. A total of 232 m^2 were excavated at 5 tipi rings, 6 cairns and as external test units.

RESULTS: Approximately 215 pieces of lithic material and bone were recovered. Most of the artifacts were quartzite debitage. After careful investigation, 3 sites (EiOw-205,207,256) were identified as natural rock features, rather than cultural.

SITE TYPES: Tipi rings, cairns, lithic scatter

REPORT: Complete, entitled "Historical Resources Impact Mitigation Montgomery Mine Expansion Project Final Report Permit 84-62", by Rebecca Balcom and Bruce Wright.

84-63	Rebecca Balcom ARESCO Ltd. 2912 - 18 Street, N.E. Calgary, Alberta	Alberta Recreation and Parks Winter Olympics facility developments

PROJECT TYPE: HRIA

LOCATION/SETTING: Alpine venue at Mount Allan (Kananaskis Valley) and nordic venue at Mount Rundle (Canmore).

METHODOLOGY: Surface inspection and judgemental shovel testing of development areas, backhoe testing within impact areas in the Kananaskis River valley; monitoring of all phases of development at both venues.

RESULTS: Five sites have been recorded to date (EfPs-11 to 13, EgPu-8, 14).

SITE TYPES: EfPs-11 - isolated find at Mount Allan.
EfPs-12 - historic foundations at Mount Allan in the valley.
EfPs-13 - historic dwellings in the upper reaches of Mount Allan.
EgPu-8 - historic site of Georgetown at Mount Rundle.
EgPu-14 - historic site at Mount Rundle.

REPORT: Report will be submitted after ongoing monitoring is complete, and will incorporate archival research into the historic sites.

84-64

Jennifer Hunt
Hunt Archaeology
646 - 28 Ave., N.W.
Calgary, Alberta

Alberta Transportation
Highway 27 widening

PROJECT TYPE: HRIA

LOCATION/SETTING: In central Alberta, west of Morrin; crosses the Red Deer River; much of the right-of-way is previously disturbed.

METHODOLOGY: A 7.5 km long right-of-way was examined by foot traverse with shovel testing in undisturbed site areas. Four previously recorded sites (EjPf-3 to 6) were re-examined.

RESULTS: Of the four previously recorded sites, one (EjPf-5) could not be relocated. Two new sites (EjPf-15, 16) were found. None were judged to be significant.

SITE TYPES: Surface scatters, possible buried camp, isolated find

REPORT: Complete, entitled "Historical Resource Impact Assessment Highway 27, Central Alberta Final Report Permit 84-64", by Jennifer Hunt.

84-65	Gerald T. Conaty Dept. of Archaeology Simon Fraser University Burnaby, B.C.	Alberta Culture/ Archaeological Survey of Canada/Environment Canada Blood Historic Sites Development Project

PROJECT TYPE: Research - site survey and compilation of oral history.

LOCATION/SETTING: Along the west side of the Oldman River, between its confluences with the Belly and St. Mary's rivers; area is generally flat to gently rolling mixed grassland, with steep valleys and coulees containing low shrubs and occasional stands of poplar. Both cultivated and uncultivated land was included.

METHODOLOGY: The study area of roughly 140 km^2 was judgementally examined by foot traverses of high potential areas such as the prairie edge above valleys and coulees, as well as valley and coulee bottoms. Where sites were observed, small samples of artifacts and debitage were collected. In addition, ethnohistoric research was conducted in conjunction with the archaeological survey.

RESULTS: Sixty-five sites were found (DjPf-94 to 109, DjPg-5, DkPf-82 to 101, DkPg-31 to 49). Ethnohistoric research identified one stone circle as the former tipi of Far-Looking, a Kainai chief. Informants also noted that a previously unrecorded medicine wheel had been constructed to honour the Kainai warrior Nitapinaw.

SITE TYPES: Stone circles, cairns, surface scatters, buried sites, drive lanes, boiling pits, historic building sites, historic grave sites, stone complex sites

REPORT: In preparation

ADDITIONAL INFORMATION: The project stimulated the interest of a large number of Kainai and non-Kainai and has increased awareness of the variety and importance of the archaeological resources on the reserve. It represents a rare opportunity to combine ethnographic and archaeological research.

84-66	Edward J. McCullough Fedirchuk McCullough & Associates Ltd. 6607 Bowness Rd., N.W. Calgary, Alberta	Husky Oil Operations Ltd. Wainwright - Lloydminster pipeline

PROJECT TYPE: HRIA

LOCATION/SETTING: Between Wainwright and Lloydminster, Alberta, traversing generally rolling to level terrain except for the crossing of Battle River; approximately 90% of the proposed right-of-way is ploughed.

METHODOLOGY: The 80 km proposed right-of-way was examined during foot traverse, with visual surface examination and shovel testing. As outlined by the Archaeological Survey of Alberta, areas exhibiting little topographic variability were excluded from assessment.

RESULTS: Nine prehistoric sites (FfOq-1,2, FfOr-4, FgOn-2, FgOo-1, FgOp-1 to 4) and one paleontological site were located. The paleontological site consists of fossiliferous material containing fragments of *Ostrea* and two fragments of *Champsosaurus* sp., in addition to a number of Teredo burrows. None of the prehistoric sites were determined to be in danger of disturbance.

SITE TYPES: Campsites, artifact scatters, stone circles, isolated finds, paleontological

REPORT: Complete, entitled "Historical Resources Impact Assessment Husky Oil Operations Ltd. Wainwright - Lloydminster Pipeline", by E.J. McCullough.

84-67

B.O.K. Reeves
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Alberta Fish and Wildlife
McKinnon Flats development

PROJECT TYPE: HRIA

LOCATION/SETTING: On McKinnon Flats, located on north side of Bow River, 4.8 km downstream from the Bow-Highwood Junction; area includes sandstone cliffs, limited terrace development, 5 m floodplain; covered by prairie previously disturbed by agricultural activities.

METHODOLOGY: Foot traverse of areas proposed for development with specific attention to previously recorded sites; backhoe tests complemented surface examination.

RESULTS: No new sites were found; 3 previously recorded sites were re-examined. EePk-216 consists of a surface and buried prehistoric campsite containing less than 10 quartzite cobble spalls and some fire broken rock. A hearth was identified in backhoe tests. EePk-219 consists of a buried prehistoric campsite located in a ploughed field. The surface was characterized by considerable quartzite cobble artifacts (100+). Four subsurface tests were dug and were positive. A buried soil was present and contained associated cultural material. EePk-253 consists of a tipi ring site (two rings) bisected by an access road.

REPORT: Complete, entitled "Final Report, Historical Resources Impact Assessment, McKinnon Flats Development, ASA Permit Number 84-67", by B.O.K. Reeves.

84-68

James Light
ARESCO Ltd.
2912 - 18 Street, N.E.
Calgary, Alberta

Altex Resources Ltd.
Maple Glen well site

PROJECT TYPE: HRIA

LOCATION/SETTING: North of Endiang, Alberta on a high rise of land in the aspen parkland.

METHODOLOGY: On two occasions, an area of 106 m^2 was surveyed, shovel tested, and test excavated with 5 1 m^2 test pits.

RESULTS: Three sites were recorded (FaPa-6 to 8). A total of 61 artifacts (non-diagnostic) were collected from FaPa-6. Three flakes and one bone fragment were found at FaPa-7.

SITE TYPES: Buried campsites, historic cellar depression

REPORT: Complete, entitled "Historical Resources Impact Assessment Maple Glen Wellsite, Final Report", by James Light.

84-69

Stanley Saylor
Fedirchuk McCullough &
Associates Ltd.
6607 Bowness Rd., N.W.
Calgary, Alberta

Home Oil Co. Ltd.
Manyberries pipeline

PROJECT TYPE: HRIA

LOCATION/SETTING: In south-central Alberta, extending from southeast of Manyberries to south of Milk River; about 2/3 of the route is cultivated, 1/3 is undisturbed prairie.

METHODOLOGY: The 136 km x 15 m right-of-way was examined by foot traverse with thorough inspection of numerous exposures; shovel testing was carried out in areas of high to moderate potential.

RESULTS: Eighty prehistoric sites, one historic and one paleontological site were found. Borden numbers are: DgPa-3 to 9, DhOx-13 to 24, DhOw-2 to 4, DiOw-4 to 8, DiOv-4 to 12, DiOt-15 to 22, DiOs-25 to 30, DiOr-6 to 10, DiOq-4 to 11, DiOp-7 to 22.

SITE TYPES: Isolated finds, artifact scatters, campsites, lithic workshops, stone feature sites (circles and cairns), kill sites, paleontological, homestead

REPORT: In preparation

84-70

Gloria J. Fedirchuk
Fedirchuk McCullough & Associates Ltd.
6607 Bowness Rd., N.W.
Calgary, Alberta

Alberta Transportation borrow pit mitigation

PROJECT TYPE: Mitigation of EaPk-96,97

LOCATION/SETTING: Located on the prairie edge overlooking Willow Creek, west of Stavely, Alberta.

METHODOLOGY: EaPk-96 was described as consisting of 3 cairns and a stone circle; EaPk-97 was described as consisting of one stone circle. Work requirements specified that 10 1 m^2 units were to be excavated in the stone circle at EaPk-96, one cairn at EaPk-96 was to be excavated, and that all features occurring at both sites were to be mapped.

RESULTS: The results of the excavation at EaPk-96 indicate that the stone circle contains a substantial quantity of cultural material. Examination of the extensive rodent disturbance and the gravel tests in the vicinity of the stone circle indicates that a wealth of additional subsurface material is associated with the stone circle. Based on the cursory examination of the surrounding area, the site extends over a minimum area of 300 x 300 m and contains numerous other stone features. The continuous horizontal distribution of the surficial cultural material observed indicates that EaPk-96 and EaPk-97 are portions of a single site.

SITE TYPES: Stone circles/cairns, stone circle

REPORT: In preparation

84-71

Stanley Van Dyke
Lifeways of Canada Ltd.
317 - 37th Avenue, N.E.
Calgary, Alberta

Shell Canada Resources Ltd.
Peace River In situ Pilot
Plant water supply line

PROJECT TYPE: HRIA

LOCATION/SETTING: Boreal Forest/Parkland-like broken with cultivated fields on and extending back from the Peace River, about 16 km downstream of the town of Peace River. The Peace River shoreline consists of a fossil floodplain backed by a thalwag. The escarpment is marked by evidence of considerable slumping. The right-of-way also intersects a major coulee.

METHODOLOGY: Foot traverse of 11 km of the 12.5 km long right-of-way (15 m wide) determined to have potential. Shovel tests were dug on well drained wooded lands along route and on the fossil floodplain (about 10 ha).

RESULTS: Two prehistoric sites (HcQg-1,2) were found.

SITE TYPES: Isolated finds

REPORT: Complete, entitled "Historical Resources Impact Assessment, Peace River In-situ Pilot Project, Peace River Expansion Project, Water Supply Pipeline", by Stanley Van Dyke.

84-72

Rebecca Balcom
ARESCO Ltd.
2912 - 18 Street, N.E.
Calgary, Alberta

Alberta Transportation
SR 527 expansion/
Sundre Airport

PROJECT TYPE: HRIA

LOCATION/SETTING: The airport is west of Sundre in undisturbed boreal foothills, while the highway is west of Stavely in primarily cultivated fields.

METHODOLOGY: The 12 km of highway right-of-way were walked, visually examined and judgementally shovel tested. The 1.5 x .5 km proposed airport was walked by means of several narrowly spaced foot traverses, visually examined and judgementally shovel tested.

RESULTS: Five sites were recorded at Stavely (EaPk-172 to 176). EaPk-172, a buried campsite that is possibly related to a nearby rock feature site, appears to be of considerable significance.

SITE TYPES: These sites are surface scatter, buried campsites and rock features.

REPORT: In preparation

84-73

Edward J. McCullough
Fedirchuk McCullough & Associates Ltd.
6607 Bowness Rd., N.W.
Calgary, Alberta

Western Oilfield Environmental Services Ltd.
North Plain Lake pipeline

PROJECT TYPE: HRIA

LOCATION/SETTING: East of Two Hills, Alberta, traversing generally level terrain except for the crossings of a small intermittent creek and an intermittent slough; approximately 95% of the proposed right-of-way is ploughed.

METHODOLOGY: The 16.8 km proposed right-of-way was examined by foot traverse, with visual surface examination and shovel testing.

RESULTS: No historical resource sites were located.

REPORT: Complete, entitled "Historical Resources Impact Assessment Merland Explorations Limited North Plain Lake Pipeline", by E.J. McCullough.

84-74

Jennifer Hunt
Hunt Archaeology
646 - 18 Avenue, N.W.
Calgary, Alberta

Gemini Engineering
Rumsey pipeline

PROJECT TYPE: HRIA

LOCATION/SETTING: East of the Red Deer River, 18 km east of Trochu, Alberta; about 36% of the route is pasture and 64% is cultivated; terrain ranges from relatively flat to gently rolling to knob and kettle.

METHODOLOGY: A battery site, 150 m x 150 m, and a 22 km x 15 m pipeline were examined by foot traverse with shovel testing in undisturbed areas and at sites; all exposures were also examined.

RESULTS: Twenty sites were found (ElPf-48 to 62, ElPe-20 to 24).

SITE TYPES: Isolated finds, small surface scatters, stone circle/cairn

REPORT: Complete, entitled "Historical Resource Impact Assessment Rumsey Pipeline - Central Alberta Final Report Permit 84-74", by Jennifer Hunt.

84-75

Eugene M. Gryba
3, 346 - 4th Avenue, N.E.
Calgary, Alberta

Clayton Surveys Ltd.
Cochrane subdivision

PROJECT TYPE: HRIA

LOCATION/SETTING: North edge and slope of Bow River valley, near Cochrane; shortgrass prairie, some aspen; upland terrain extending away from edge of the river valley is under cultivation.

METHODOLOGY: Intensive foot traverse of the cultivated fields and grass covered valley slope; visual inspection of gravel quarry and other excavations for exposed paleontological resources.

RESULTS: No sites were found.

REPORT: Complete, entitled "Historical Resources Impact Assessment of Northwest Quarter of Section 6-26-3-5 near Cochrane, Alberta", by Eugene M. Gryba.

84-76

Jim Calder
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Suncor Inc. Exploration
Resources Group
Well site (No. 4-34)

PROJECT TYPE: HRIA

LOCATION/SETTING: Prairie edge adjacent to Red Deer River north and east of Drumheller; prairie setting, but area had previously been disturbed by agricultural activities; short mixed grasses and rough fescue in undisturbed localities.

METHODOLOGY: Foot traverses of well site area about 122 m x 122 m in size.

RESULTS: One prehistoric site was identified (EiPd-5). Site consists of quartzite flakes, chert core, chert scraper, quartzite biface and chopper. Material was diffusely distributed on side slope between prominent knob and intermittent slough.

SITE TYPE: Surface scatter

REPORT: Complete, entitled "Final Report, Historical Resources Impact Assessment, Suncor Wellsite 4-34, Drumheller, Alberta, Permit Number 84-76", by Jim Calder.

84-77	**John Pollock** **Settlement Surveys Ltd.** **19 Addison Crescent** **St. Albert, Alberta**	**Dome Petroleum Limited** **Heavy oil recovery plant**

PROJECT TYPE: HRIA

LOCATION/SETTING: Southeast of Elk Point, Alberta

METHODOLOGY: Systematic foot traverses and subsurface testing; surface inspection of ploughed areas.

RESULTS: Five prehistoric sites were found (FkOq-12 to 16).

SITE TYPES: Surface scatters and isolated finds

REPORT: In preparation

84-78	Rebecca Balcom ARESCO Ltd. 2912 - 18 Street, N.E. Calgary, Alberta	Gulf Canada Resources Inc. Lonepine Creek pipeline

PROJECT TYPE: HRIA

LOCATION/SETTING: Carstairs-Crossfield area north of Calgary; primarily cultivated prairie except at river/creek/coulee crossings.

METHODOLOGY: Surface inspection with judgemental shovel testing along the 19 km long route.

RESULTS: Twelve sites were recorded (EjPl-4 to 15).

SITE TYPES: EjPl-4 is a quarry site which the pipeline was realigned to avoid. The remaining sites are small and consist of isolated finds, lithic scatters, and buried campsites.

REPORT: Complete, entitled "Historical Resources Impact Assessment Lonepine Creek Pipeline", by Rebecca Balcom.

84-79	**Stanley Van Dyke** **Lifeways of Canada Ltd.** **317 - 37th Avenue, N.E.** **Calgary, Alberta**	**Burnco Rock Products** **Borrow pit expansion**

PROJECT TYPE: Mitigation of EgPn-208 (burial)

LOCATION/SETTING: Located on escarpment edge on north side of Bow River at the west end of City of Calgary; in prairie grasslands with shallowly buried till.

METHODOLOGY: Excavation of a block 11 m^2 in size surrounding the reported area of human burial, with pedestal of burial area and lateral removal.

RESULTS: Excavations revealed a late prehistoric campsite associated with a cairn-like feature. Assemblage consists of a projectile point, 2 scrapers, core fragments and lithic debitage; fire broken rock is abundant. Raw materials include quartzites, Knife River Flint, obsidian, siltstones and pebble cherts. Ninety osteological specimens, primarily bone splinters, were recovered. Bison, elk and deer are represented. Two specimens are positively, and 3 are tentatively, identified as human. Human specimens are widely dispersed suggesting a disarticulated, secondary, or disturbed burial not likely associated with the prehistoric component.

SITE TYPE: Buried campsite

CULTURAL AFFILIATION: Old Women's Phase

DATES: About A.D. 600 - A.D. 900, based on projectile point typology and depth of cultural component.

REPORT: Complete, entitled "Final Report, Conservation Excavations, EgPn-208", by Stanley Van Dyke.

84-81

Bea Loveseth
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Peace Pipe Line Limited
Valhalla/Spirit River
pipeline extension

PROJECT TYPE: HRIA

LOCATION/SETTING: Wapiti Plain and Peace River Lowland, crossing the Saddle Hills. Area is characterized by aspen poplar forests; 70% of alignment has been cultivated.

METHODOLOGY: Foot traverse of 15 m right-of-way, for approximately 48 km; spot checks of sensitive areas over a distance of about 16 km.

RESULTS: Eight prehistoric sites were identified (GiQt-3 to 8, GjQr-4, GkQr-4). All of the sites had been disturbed by ploughing. Finds consisted of quartzite flakes, fire broken rock, a biface, a chipped stone axe, and a knife.

SITE TYPES: Isolated finds, small scattered finds

REPORT: Complete, entitled "Final Report, Historical Resources Impact Assessment, Deep Basin Pipeline System, Valhalla/Spirit River Extension, ASA Permit Number 84-81", by Bea Loveseth.

84-82

Bea Loveseth
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Alberta Transportation
Highway Upgrading of SR940

PROJECT TYPE: HRIA

LOCATION/SETTING: Near Sundre, Alberta, in Rocky Mountain foothills mixed wood and coniferous forests in area of aspen/spruce ecotone; 11 km of roadway, approximately 50 m wide, located at edge of Forestry Reserve Boundary.

METHODOLOGY: Foot traverse of approximately 6 km of undeveloped roadway; assessment of EjPt-2 was by shovel tests.

RESULTS: Two new prehistoric sites were identified (EjPs-3, EjPt-3). EjPt-3 yielded 2 lithic fragments and is largely destroyed. EjPs-3 consists of 3 flakes and a core, all located on surface and confined to disturbed area of road construction. EjPt-2 was shovel tested, and 2 tests each yielded 2 lithic items.

SITE TYPES: Lithic scatter, small find

REPORT: Complete, entitled "Final Report, Historical Resources Impact Assessment, Portions of SR 940, Assessment of EjPt-2, ASA Permit Number 84-82", by Bea Loveseth.

84-83

John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

Texaco Canada Resources Ltd.
Frog Lake Exploration Program

PROJECT TYPE: HRIA

LOCATION/SETTING: East of Frog Lake, Alberta; area has a strongly rolling terrain covered with an open aspen forest.

METHODOLOGY: Foot reconnaissance of 9 well sites (100 m x 100 m) and about 5.5 km of access roads; judgementally placed shovel tests were dug every 100 m or less on the roads and in a minimum of 25 locations on the well sites.

RESULTS: Two prehistoric sites (FlOn-1 and 3) were found, plus one historic archaeological site (FlOn-2).

SITE TYPES: Prehistoric campsite, isolated find, and buried cabin foundation

REPORT: Complete, entitled "Historical Resources Impact Assessment Well Sites and Access Roads Frog Lake Exploration Program", by John Pollock.

84-84

Stanley Saylor
Fedirchuk McCullough & Associates Ltd.
6607 Bowness Rd., N.W.
Calgary, Alberta

Home Oil Co. Ltd.
Manyberries pipeline

PROJECT TYPE: Mitigation of DgPa-3, DgPa-4, DiOw-6

LOCATION/SETTING: DgPa-3 is near the Milk River, disturbed by cultivation; DgPa-4 is adjacent to the Milk River, relatively undisturbed; DiOw-6 is on the north side of Crow Indian Lake, covered by aeolian sand.

METHODOLOGY: Investigation of all sites involved 3 phases: 5 x 5 m shovel tests, 1 x 1 m test squares and 1 x 1 m excavation units. At DgPa-3, 5 shovel tests, 5 test squares and 13 excavation units (in block) were excavated. At DgPa-4, 6 shovel tests, 5 test squares and 30 excavation units (in block) were excavated. At DiOw-6, 10 shovel tests, 5 test squares and 20 excavation units (in transect design) were excavated.

RESULTS: DgPa-3 yielded 1600 artifacts, including Saskatchewan Basin ceramics and a Late Prehistoric projectile point. DgPa-4 contained three buried occupations yielding Saskatchewan Basin ceramics, unnotched triangular projectile points and a Pelican Lake point. DiOw-6 yielded significant samples of Late Prehistoric, Pelican Lake, Bitterroot and early side notched material, in addition to a buried soil horizon tentatively estimated at 8,000 years B.P.

SITE TYPES: Buried campsites, campsite

CULTURAL AFFILIATION: DgPa-4 - Pelican Lake
DiOw-6 - Pelican Lake, Bitterroot

DATES: All based on projectile point typology:
DgPa-3 - Late Prehistoric
DgPa-4, DiDw-6 - Late Prehistoric, Middle Prehistoric

REPORT: In preparation

84-85

Gloria J. Fedirchuk
Fedirchuk McCullough &
Associates Ltd.
6607 Bowness Rd., N.W.
Calgary, Alberta

Esso Resources Canada Ltd./
TransAlta Utilities
Corporation
Judy Creek North
thermal coal project

PROJECT TYPE: HRIA

LOCATION/SETTING: In the boreal forest southeast of Swan Hills, Alberta; two major lakes, Kidney Lake and Ash Lagoon Lake, as well as a number of unnamed lakes, Judy Creek, and its tributaries are found in the study area, while the Freeman River lies immediately north.

METHODOLOGY: In consultation with the Archaeological Survey of Alberta, the following areas were identified for examination: the margins of Kidney Lake, Ash Lagoon Lake, the unnamed lakes, and Judy Creek, as well as disturbance along existing cutlines and trails. The margins of the water bodies were examined by extensive shovel testing, while areas along cutlines and trails were visually examined. Previously identified sites were relocated.

RESULTS: Two new historic sites (GcPt-H1, GdPt-H1) were recorded, and 18 prehistoric sites (GcPt-8 to 23, GdPu-10,11) were found. Eleven sites are located on Ash Lagoon Lake, 5 sites are on Kidney Lake and 2 are on Judy Creek. Of the 15 previously recorded historic sites in the study area, 9 were relocated. The 16 previously recorded prehistoric sites were all revisited.

SITE TYPES: Campsites, artifact scatters, quarry, isolated finds, historic animal trap, log cabin

REPORT: In preparation, to be entitled "Historical Resources Impact Assessment Judy Creek North Thermal Coal Project", by G.J. Fedirchuk.

84-86

Gloria J. Fedirchuk
Fedirchuk McCullough &
Associates Ltd.
6607 Bowness Rd., N.W.
Calgary, Alberta

Amoco Canada Petroleum
Ltd.
Elk Point
thermal project

PROJECT TYPE: HRIA

LOCATION/SETTING: South of Elk Point, Alberta, in the parkland region; approximately 95% of the project area is ploughed. The terrain consists of generally level to strongly undulating ground moraine. Death River, Irish Creek, and their tributaries as well as a number of intermittent unnamed creeks drain the study area.

METHODOLOGY: Approximately 10 sections of land are required for the proposed thermal project. According to specifications outlined by the Archaeological Survey of Alberta, only those areas found to be associated with prehistoric sites in the past and areas which were undisturbed were to be examined. As a consequence, lake and slough margins, creek and river edges, and knolls and ridges were selected for examination, by foot traverse with visual surface examination and shovel testing.

RESULTS: Thirty-two historical resource sites were located; 27 are prehistoric (FkOq-11, 17 to 22, FkOr-4 to 21, FlOr-3,4) and 5 are historic.

SITE TYPES: Campsites, artifact scatters, isolated finds, farmsteads, historic artifact scatter

REPORT: Complete, entitled "Historical Resources Impact Assessment Amoco Canada Petroleum Co. Ltd. Elk Point Thermal Project", by G.J. Fedirchuk.

84-87

Bea Loveseth
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Alberta Transportation
Cowley borrow pit expansion

PROJECT TYPE: Mitigation, DjPm-1

LOCATION/SETTING: On a high terrace on south bank of Crowsnest River (70 metres above valley bottom); 3.2 km north of Cowley, Alberta, in grasslands; site area reportedly consists of more than 90 stone circles covering an area of approximately 400 m along terrace edge.

METHODOLOGY: In area specifically required for borrow pit expansion, stone configuration maps were prepared for 6 stone circles; one stone circle was completely excavated.

RESULTS: Mapped ring diameters range from 5.41 to 6.22 m and contained between 32 and 61 rocks. Excavation of 21 m^2 in ring 9 resulted in the recovery of a single bone fragment, not believed to be associated with the living floor.

REPORT: Complete, entitled "Final Report, Impact Mitigation, Archaeological Investigations, DjPm-1, ASA Permit Number 84-87c", by Bea Loveseth.

84-88	Margaret Kennedy Lifeways of Canada Ltd. 317 - 37 Avenue, N.E. Calgary, Alberta	United Church Historic Sites Committee McDougall Mission Historic Site

PROJECT TYPE: Research assessment and excavation at EhPq-6

LOCATION/SETTING: Morleyville area, on north side of Ghost Reservoir west of Jacob Creek on first and second terraces above river.

METHODOLOGY: Prefield inventory used contemporary written descriptions and sketches, available aerial photography and careful traverse of site. Field assessment included proton magnetometer survey, tests excavations in identified structural and associated features, and mapping of site.

SITE TYPE: Site consists of McDougall Church (still in use) and school (archaeological feature) on upper bench, and mission (archaeological site - no standing structures) on lower bench.

DATES: Historic Mission founded by the Methodists George and John McDougall in 1875. Mission was in decline by 1921, when another church was built in Morley and the McDougall Church was abandoned.

RESULTS: Excavations were undertaken at 9 different features including the Mission House, house foundation tentatively identified as Andrew Sibbald's, two privies, an unidentified foundation depression south of the Mission House, and various other cultural features. Project incomplete due to onset of early winter conditions; excavation program to continue in spring 1985.

REPORT: Interim report complete, entitled "Research Excavations at the McDougall Mission Historic Site", by Margaret Kennedy. Final report to be prepared after completion of research excavation program.

84-89

Peter T. Bobrowsky
4604 - 119 Avenue
Edmonton, Alberta

Alberta Transportation
Elk River road/
Smoky River road

PROJECT TYPE: HRIA

LOCATION/SETTING: Elk River road near Lodgepole and Smoky River road near Grande Cache; both are partially disturbed.

METHODOLOGY: Systematic foot traverse of proposed alignments and judgementally placed shovel testing (50 x 50 cm); alignments examined were 5 km long for Elk River road and 16.2 km long for Smoky River road. Previously recorded site FfQa-1 was assessed for extent of impact resulting from the new alignment of Elk River road.

RESULTS: No historical, archaeological or paleontological sites were found in the study areas. Impacts to FfQa-1 were judged not significant and no significant archaeological materials were found.

REPORT: In preparation

84-90

Stanley Van Dyke
Lifeways of Canada Ltd.
317 - 37th Avenue, N.E.
Calgary, Alberta

Coseka Resources Ltd.
Liege Prospect gas
pipeline

PROJECT TYPE: HRIA

LOCATION/SETTING: Approximately 100 km west of Fort McMurray, Alberta, in boreal forest adjacent to Mink and Grew lakes and Chipewyan River crossing.

METHODOLOGY: Foot traverses with systematic shovel tests every 50 m along selected portions of right-of-way between Mink and Grew lakes and at Chipewyan River crossing (about 7 km x 15 m).

RESULTS: No prehistoric sites were identified.

REPORT: Complete, entitled "Historical Resources Impact Assessment, Liege Prospect Area Pipeline Right-of-Way", by Stanley Van Dyke.

84-91

John Pollock
Settlement Surveys Ltd.
19 Addison Cresent
St. Albert, Alberta

Cross Country Realty
Dunes residential
subdivision

PROJECT TYPE: HRIA

LOCATION/SETTING: Near Grande Prairie, Alberta, on the north side of the Wapiti River; land generally flat with small muskeg areas and sand dunes.

METHODOLOGY: Area of two sections was surveyed by systematic foot traverses and subsurface tests placed judgementally about every 100 m; on sand dune features, subsurface tests were placed every 20 to 50 m.

RESULTS: Two prehistoric sites were located (GgQq-3 and 4).

SITE TYPES: Buried camp, isolated find

REPORT: Complete, entitled "Historical Resources Impact Assessment The Dunes Subdivision North 1/2 Section 25-70-6-W6M", by John Pollock.

84-93

Gloria J. Fedirchuk
Fedirchuk McCullough & Associates Ltd.
6607 Bowness Rd., N.W.
Calgary, Alberta

Esso Resources Canada Limited
Cold Lake commercial development area

PROJECT TYPE: HRIA

LOCATION/SETTING: Northwest of Grand Centre, Alberta; the margins of the south shore of Borque Lake, the margins of Leming Lake, and the margins of Jackfish Creek were examined during this project. The topography along Bourque Lake ranges from swampy lowlands to relatively flat sandy beaches; occasional ice-pushed ridges also occur. Around Leming Lake, the terrain ranges from low, sedge-filled bays to gently undulating and flat, well drained uplands supporting spruce-aspen forest. The borders of Jackfish Creek typically consist of sandy plains and benches supporting open jackpine forest.

METHODOLOGY: The project area was examined by foot traverse and extensive shovel testing in areas of high archaeological potential.

RESULTS: Eighteen prehistoric sites were identified (GdOo-24 to 28, GdOp-1, 4 to 14, GeOp-4).

SITE TYPES: Campsites, artifact scatters, isolated finds

REPORT: Complete, entitled "Historical Resources Impact Assessment Esso Resources Canada Limited Cold Lake Commerical Development Area", by G.J. Fedirchuk.

84-94

Heinz Pyszczyk
Archaeological Survey
of Alberta

Alberta Culture
Hunt House
(H.B. Co. Store)

PROJECT TYPE: HRIA

LOCATION/SETTING: The original structure (H.B. Co. store) is located on the east bank of the Elbow River, across from historic Fort Calgary, in the City of Calgary. The area around the site has been landscaped.

SITE TYPE/DATES: Historic H.B. Co. Store (1876 - 1900)

METHODOLOGY: A total of 16 50 cm^2 test units were excavated around the store and other parts of the site.

RESULTS: No structural remains were uncovered. A relatively large quantity of artifacts/bone was found, and consisted primarily of undiagnostic materials which likely represent a mixture from store occupation and 20th century occupation.

REPORT: In preparation

84-95

James Light
ARESCO Ltd.
2912 - 18 Street, N.E.
Calgary, Alberta

Norcen Energy Resources
Ltd.
Majorville well site
access road

PROJECT TYPE: HRIA

LOCATION/SETTING: East of Milo, Alberta, on the hills west of the Bow River valley, near the Majorville cairn.

METHODOLOGY: Surface reconnaissance and shovel testing were conducted.

RESULTS: Four sites were recorded (EdPc-49 to 52). All sites were avoided by resurveying the proposed road.

SITE TYPES: Tipi ring sites (one with probable effigy figure), possible cairn

REPORT: Complete, entitled "Historical Resources Impact Assessment Majorville Wellsite Access Road", by James Light.

84-96

Rebecca Balcom
ARESCO Ltd.
2912 - 18 Street, N.E.
Calgary Alberta

Alberta Culture
Ukrainian "Burdei"
(dugout)

PROJECT TYPE: Research excavation to investigate construction of a Ukrainian dugout house (FkOv-4).

LOCATION/SETTING: North of Two Hills and the North Saskatchewan River in the aspen parkland.

METHODOLOGY: One complete "burdei" was excavated.

RESULTS: Although little was found in way of material culture, architectural details were discovered.

REPORT: In preparation

84-97

John Pollock
Settlement Surveys Ltd.
19 Addison Crescent
St. Albert, Alberta

Alberta Power Ltd.
H.R. Milner-Simonette
transmission line

PROJECT TYPE: HRIA

LOCATION/SETTING: North of Grande Cache, Alberta, crossing a variety of topographic conditions.

METHODOLOGY: Foot traverse and subsurface testing of medium and high potential areas along the 7 km long right-of-way.

RESULTS: No sites were located.

REPORT: Complete, entitled "Historical Resources Impact Assessment for the Proposed 144 kV Transmission Line Reroute - H.R. Milner - Crystal Lake - Simonette (7L20/7L80)", by John Pollock.

84-98

Bea Loveseth
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Suncor Inc. Resources
Group
Well sites

PROJECT TYPE: HRIA

LOCATION/SETTING: In Drumheller district, on prairie edge overlooking Red Deer River and along the course of Michichi Creek (N=3); the study area included about 8% ploughed, 75% stubble and 7% undisturbed lands.

METHODOLOGY: The well sites involved 6.7 ha in area. Several snowcovered well sites were brushed; all were backhoe tested. Exposed areas were examined by foot traverses.

RESULTS: No prehistoric sites were identified.

REPORT: Complete, entitled "Final Report, Historical Resources Impact Assessment, Suncor Wellsite Leases, Drumheller, Alberta, Permit Number 84-98", by Bea Loveseth.

84-99

Rebecca Balcom
ARESCO Ltd.
2912 - 18 Street, N.E.
Calgary, Alberta

Canadian Superior Oil Ltd.
Taber pipeline and
well site

PROJECT TYPE: Historical resource reconnaissance

LOCATION/SETTING: Pipeline is north of Taber; well site is west of Taber on the south side of the Oldman River; terrain ranges from hummocky to fairly level and is in native shortgrass prairie.

METHODOLOGY: Surface examination by foot transects of 4.9 km of pipeline right-of-way and a well site about 1.1 ha in size; no shovel testing due to frozen ground.

RESULTS: Four sites were recorded in the vicinity of the pipeline (DlPb-5 to 8) and one was recorded in the vicinity of the well site (DkPb-13).

SITE TYPES: Multiple rock feature sites, consisting primarily of tipi rings, but including cairns/rock alignments.

REPORT: Complete, entitled "Historical Resources Reconnaissance Canadian Superior Pipeline and Wellsite near Taber", by Rebecca Balcom.

84-100

Bea Loveseth
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Gulf Canada Resources Inc.
Dome Lease
well site

PROJECT TYPE: HRIA

LOCATION/SETTING: Located 39 km west of Innisfail, adjacent to intermittent creek approximately 400 m north of the Raven River; in Parklands of Alberta, aspen/spruce ecotone immediately east of foothills.

METHODOLOGY: The examination was in response to landowner information of artifactual material in vicinity of the 1.6 ha well site. At the time of study, well site was partially covered in snow, but the exposed area was examined by foot traverses; area of well site was tested by backhoe to confirm judgement.

RESULTS: Reported prehistoric site was recorded as FaPo-16. It is located outside of the well site and east of intermittent creek, and was previously disturbed. Material was originally found on access road to silos from Highway 54, and was collected by landowner. Items included McKean projectile point, bifaces, point fragments and grooved maul. No other sites were identified.

SITE TYPE: Surface scatter

CULTURAL AFFILIATION: McKean

DATES: About 4500-3000 B.P., based on projectile point typology.

REPORT: Complete, entitled "Final Report, Historical Resources Impact Assessment, Gulf Dome Lease 16-12-36-4-W5M, ASA Permit Number 84-100", by Bea Loveseth.

84-101

Stanley Saylor
Fedirchuk McCullough & Associates Ltd.
6607 Bowness Rd., N.W.
Calgary, Alberta

PanCanadian Petroleum Ltd.
Well site

PROJECT TYPE: HRIA

LOCATION/SETTING: In southern Alberta, near Carmangay, in a largely cultivated area.

METHODOLOGY: A brief reconnaissance of a well site approximately 36.6 m x 36.6 m in size.

RESULTS: No sites were found.

REPORT: In preparation

84-103

Bea Loveseth
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Suncor Inc. Resources Group
Manyberries well site

PROJECT TYPE: HRIA

LOCATION/SETTING: Located in broad valley of South Manyberries Creek, approximately 13.5 km southeast of Manyberries, Alberta; adjacent to low velocity creek in undisturbed area consisting of short prairie grasslands with tumbleweed and prickly pear cactus.

METHODOLOGY: Area examined by foot traverse with inspection of exposed areas, adjacent disturbed lands and creek bank. Shovel testing not undertaken due to frost.

RESULTS: No prehistoric sites were identified.

REPORT: Complete, entitled "Final Report, Historical Resources Impact Assessment, Suncor Manyberries 14-29-4-4-W4M, Wellsite and Access Road, ASA Permit Number 84-103", by Bea Loveseth.

84-104

Stanley Saylor
Fedirchuk McCullough & Associates Ltd.
6607 Bowness Rd., N.W.
Calgary, Alberta

Bow River Pipe Lines Ltd.
Chin Coulee
pipeline extension

PROJECT TYPE: HRIA

LOCATION/SETTING: In southeastern Alberta, at Chin Coulee, near Foremost; areas examined were uncultivated, shortgrass prairie on predominantly level to gently rolling terrain.

METHODOLOGY: Of the 27 km x 15 m right-of-way, only the uncultivated portions (totalling about 4 km) were examined by foot traverse. Frozen ground negated shovel testing, but backhoe tests were conducted near stone features and in the bottom of the coulee.

RESULTS: Numerous stone circles were found in the area, and 4 sites were identified (DjOx-1 to 4). Route was realigned to avoid all but 1 stone circle, which was tested but revealed no significant material. Backhoe testing found nothing.

SITE TYPES: Stone circles

REPORT: Complete, entitled "Historical Resources Impact Assessment Bow River Ltd. Chin Coulee Pipeline Project", by S.G. Saylor.

Federal Lands

Margaret Kennedy
Lifeways of Canada Ltd.
317 - 37 Avenue, N.E.
Calgary, Alberta

Alberta Transportation
SR509 (Blood Reserve)

PROJECT TYPE: Conservation excavation program at historic site complex DkPf-2.

LOCATION/SETTING: North end of Blood Reserve on south side of Oldman River across from Kipp; on protected flats above floodplain ("Get Wood Bottoms").

SITE TYPE: A major historic site complex associated with Conrad's Post, a whiskey post dating to 1871-72, including rock hearths, alignments, cairns and ring features, a large activity area adjacent to graves of three natives and potential dump scatters associated with both the post and a slightly later Reserve Period cabin foundation.

METHODOLOGY: A two-phased approach was utilized in the 1984 program, consisting of initial assessment excavations of 3 36 m^2 block excavations at selected locales (Phase 1), and a flexible research design for excavation of dispersed features along the length of the right-of-way across the flat (Phase II). Several different excavation techniques were used for specific types of features, e.g., radial excavations, regular 1 x 1 m units and linear transects. Surface artifacts were mapped and collected, and a detailed site map was prepared.

RESULTS: Some rock hearths appear to have been sweat lodge fires. An impressive infilled rock cairn on a remnant terrace below the post flat did not reveal any significant artifactual material when excavated. The activity/dump area south of the graves proved to be highly productive and very significant. Large quantities of butchered bone (bison, antelope, rabbit, grouse) and artifacts (e.g., cartridge cases, buttons, wire, tin cans, etc., dateable to the 1870s) lay interspersed with wood chips and charcoal. This has been interpreted as a possible second whiskey post on Get Wood Bottoms.

REPORT: In preparation, to be entitled "Conservation Excavations at DkPf-2, a Major Historic Site Complex on the Blood Reserve", by Margaret Kennedy and Bob Steinhauser.

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